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# ADDRESSES AND ORIGINAL ARTICLES

## X-RAY KYMOGRAPHY OF THE HEART

By Franklin G. Wood, M.B. Camb., D.M.R.E.
RADIOLOGIST TO THE LONDON CHEST HOSPITAL AND TO THE GERMAN HOSPITAL, DALSTON

(WITH ILLUSTRATIONS ON PLATE)

X-RAY kymography is a method of recording the movements of the beating heart on an X-ray film. A lead plate with horizontal slits 0·5 mm. in width spaced at regular intervals (11·5 mm. to 45 mm.) is interposed between the patient and the film. Each slit allows a narrow beam of X rays to fall on the film. There are then two ways of recording the movements of the heart. In the first method the grid remains stationary and the film moves; in the second the film is stationary and the grid moves.

The effect of moving the film is shown diagrammatically in fig. I. The slits A, B, C, are each opposite a given part of the heart border and each of them will record the lateral and medial movements of the border of the heart as a wavy outline when the film is moved. In the ventricular region movement away from the middle line represents diastole and towards the middle line systole. It will be noticed that the outline of the heart is interrupted at every segment.

When the grid is moved instead of the film each horizontal slit travels down slowly along the heart border in its own area and makes a continuous tracing of the heart outline, which appears as a wave form. This method gives a continuous picture of the heart outline and a film is obtained which is very similar to that seen in a teleradiogram with the additional advantage that the heart movements are recorded.

During the last two years I have been engaged in devising a simple apparatus which can be installed at relatively little cost and will give good kymograms with a moving grid. The object of this paper is to describe some of the results obtained. The grid used is large enough to cover an ordinary 15 by 12 in. chest film. With an apparatus of good output it is possible to work at a focus film distance of six feet. The patient is asked to hold his breath, the mid-point of respiration being selected when possible. The reason for this is that movements of the diaphragm may upset the wave form.

For the results obtained with a stationary grid and the method of making tracings by means of a densometer, the reader is referred to the works of Stumpf (1934, 1936) in Germany and a recent publication by Bordet and Fischgold (1937) in France. There is no absolute standard of wave form, each individual showing a slightly different pattern. Stumpf describes two main types. In type I, which is considered the more normal, the pulsations obtained in the ventricular region are greater at the apex of the heart (fig. I). In type II the pulsations are diminished at the apex and greater in the upper part of the left ventricular border. Fig. II, which is a tracing of the kymogram of an apparently normal heart, is an example of type II. The tracing should be read from above downwards and it should be remembered that the parts of each segment are synchronous. The exposure time was three seconds. During that period three complete cycles of the heart were recorded.

The left border of the heart may be divided into the following areas: aortic, pulmonary, region of mixed movements, ventricular.

### LEFT BORDER OF THE HEART

*Aortic area.*—The waves in the region of the aorta have a horizontal upper limb representing the lateral displacement of the aortic arch by the sudden impact of the pulse wave and a lower sloping border ascribed to the slower medial return in diastole. Weltz suggests that the pulsations noted in the arch of the aorta are the result of displacement and not of expansion of this organ (Stumpf, Weber and Weltz 1936). This can be shown by giving a barium swallow and rotating the patient so that the aortic impression on the œsophagus is visible. A kymogram taken in this position will show the movements of both borders of the aorta and they will be found to be synchronised, the two sides moving simultaneously to the right or to the left. The aortic area occupies 2–3 segments in the kymogram and is separated from the pulmonary area by a slight break in the wavy outline of the heart.

The *pulmonary artery area* shows a very similar wave form to that seen in the aortic region. The pulsations are visible in the larger vessels at the hilum, and may also be seen in some of the smaller branches in the lung fields. These waves are not in the nature of transmitted impulses in the larger vessels, but are due to the pulse pressure in the individual arteries.

*Area of mixed movements.*—Reference to fig. II will show that below the pulmonary artery an area of double or mixed movements is visible in segments 6 and 7. Contrary to the opinion usually held, kymography indicates that the left border of the heart is formed here by the left auricle and that these waves are due to pulsations in the left auricular appendix as it projects forwards anterior to the root of the pulmonary artery. In mitral stenosis the area of double movements is increased (see fig. IV).

*Left ventricular area.*—The waves in the left ventricular region show a curved upper border which represents diastole. The lower segment is almost horizontal and is caused by the rapid contraction of the ventricle in systole. It should be noted that the waves are the reverse of those seen in the aortic area, the upper border being curved instead of horizontal and the systolic movement being towards the middle line. The ventricular waves are usually more powerful at the apex than at the base. The degree of contraction in systole varies between 2·5 mm. and 6 mm. in a normal heart.

### RIGHT BORDER OF THE HEART

The right border of the normal heart includes the right auricle, a small part of the inferior cava below and the superior vena cava above. The kymograph does not easily record very rapid or very shallow contractions; hence the finer movements of the right auricle are not always shown in the ordinary kymographic film. It appears probable also that the contractions of the subjacent right ventricle affect the wave form. Consequently in many cases the pulsations are ventricular in type. In others a fine notch can be detected on the lower limb of the wave which may be ascribed to the systole of the left auricle. The upper part of the right border in the region of the superior vena cava is often obscured by the vertebral column and pulsations are then not visible. They are variable in size and shape. Faber and Kjaergaard (1936) have suggested that the right ventricle may sometimes form part of the right border.

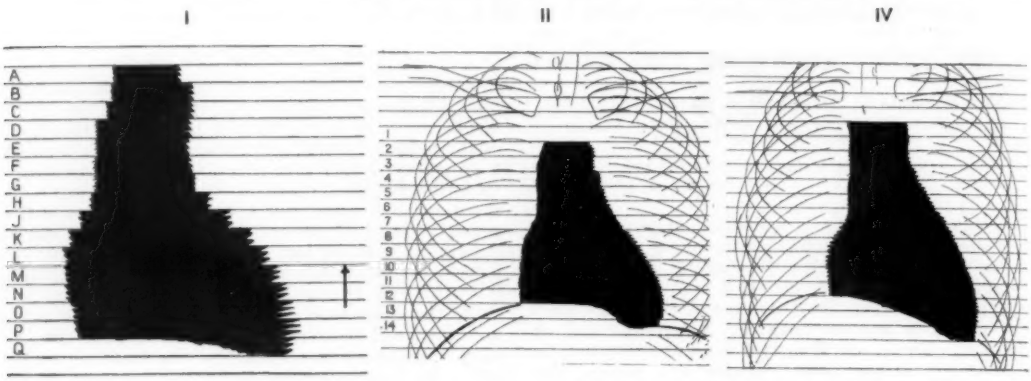



FIG. I—Tracing of a kymogram of the normal heart taken with the film moving. Read from below upwards. The movements are greater at the apex of the heart (type I).

FIG. II—Tracing of a kymogram of the normal heart taken with the grid moving. Read from above downwards. The movements are greater in the upper part of the left ventricular border (type II).

FIG. IV—Tracing of a kymogram of a heart with mitral stenosis. Mixed movements are visible on the left border to within three segments from the apex.

From the foregoing description it will be seen that the film taken with the moving grid shows the outline of the heart and records the pulsations of its component parts and that it is a substitute for and an improvement on the ordinary teleradiogram.

### RESPIRATORY MOVEMENTS

The effect of respiration on the heart movements is variable. As a general rule in expiration the domes of the diaphragm move upwards and the heart is elevated and appears larger. Consequently a wave form is transmitted to the two borders of the heart, the right border moving to the right in expiration and the left to the left. This interferes with the normal kymographic outline. In other cases a pendulum movement (Weltz) is seen, the heart and aorta swinging to the left in expiration and slightly to the right in inspiration. The movement may be reversed in cases of emphysema. Figs. IIIA and IIIB show tracings of the right and left borders of the heart obtained from a case of mitral stenosis. Two short respirations were made during the exposure and it will be noted that on the right border of the heart these are clearly seen and that they synchronise with the respiration, the heart border moving to the right in expiration. Similar movements are seen on the left border both in the region of the aorta and pulmonary artery and also in the left ventricular area. During expiration the left border of the heart and the great vessels move to the left. It will be obvious that if a radiogram of the heart is required any interference from respiration must be avoided, and this is best done by instructing the patient to hold the breath in or near the mid-point of respiration.

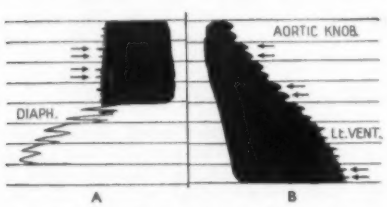



FIG. III—Tracings of parts of a kymogram of a heart with mitral stenosis, showing displacement (marked by arrows) on expiration during two respirations. A, lower part of right border of heart; B, upper part of left border of heart.

Kymography has a considerable application in the examination of the lungs and the diaphragm, but it is not possible in a short paper to describe the results which can be obtained.

### VALVULAR DISEASE

The alterations seen in the kymogram in cases of valvular disease may now be described.

*Mitral stenosis.*—The waves show some interesting variations from the normal in this condition:—

*Left border.*—The aortic pulsations are diminished, the pulmonary waves are increased, and the area of double movement may be continued downwards so as to encroach on the left ventricular region (fig. IV).

*Right border.*—When compensation is good the pulsations are increased. The outline of the left auricle can usually be separated from that of the right auricle. There may even be a double serrated border and the upper may be identified as the left auricle (see fig. V on plate). When compensation is lacking the border becomes obscured by congestive changes in the lungs.

Fig. IV shows a moderate degree of mitral stenosis. It will be noted that the mixed type of movements are visible on the left border to within three segments of the apex of the heart.

Fig. VI shows a more advanced stage. The right border of the heart is obscured by pulmonary congestion. The left border shows a considerable prominence in the region of the left auricle which shows irregular pulsations. This heart was fibrillating at the time of the examination and the normal ventricular pulsations alternate with a smaller medial movement represented by a notch in the middle of diastole.

*Aortic regurgitation.*—Fig. VII shows a kymogram of a patient suffering from aortic regurgitation which was rheumatic in origin. The reader will see that there is enlargement of the left ventricle and that the pulsations are increased in the upper part of the ventricular area and decreased at the apex of the heart. The pulsations are exaggerated on the left border of the aortic arch. The appearances are very characteristic in this case, but the increase in the aortic pulsations is not always so obvious. Transmitted pulsations, however, are often visible in the

lung field opposite the aortic knob. When the aortic regurgitation is non-rheumatic in type and is associated with hypertension and aortitis, increased pulsations may be seen on the upper part of the right border of the heart owing to the lateral displacement of the ascending part of the arch (fig. VIII).

*Aortic stenosis.*—The characteristic feature of aortic stenosis as distinct from regurgitation is the relatively long duration of the systolic curve. The aortic pulsations are usually diminished.

### OTHER CONDITIONS

*Lesions of the aorta.*—The kymograph is of especial value in the radiological examination of the aorta. In arteriosclerosis with elongation and unfolding of the aortic arch, the pulsations are usually well seen. With hypertension they are often increased. Sometimes the movements are diminished or absent, the aorta appearing as a rigid tube. Widening of the aortic arch, from aortitis in the absence of aortic incompetence, gives a diminution of the movements. In general we can say that the movements diminish with increase in size of the aortic arch. Where an aneurysm is present the degree of pulsation is readily shown in the kymogram. If the aneurysmal sac is considerably distended and contains blood-clot the pulsations are absent in the upper part of the sac giving a characteristic appearance (fig. IX).

The kymograph can be used in the differential diagnosis of aneurysm and new growth. Where a neoplasm is in close contact with the aorta it usually shows up as a separate mass which may be non-pulsatile, the aorta being seen as a separate pulsating shadow. When the growth is in more intimate contact with the aortic arch it is more difficult to separate the two shadows, but a distinction can be made by studying the outline of the mass and the character of its edge. A spiky, serrated edge is in favour of neoplasm.

A *retrosternal goitre* commonly shows a shadow in the neighbourhood of the aortic arch which may be confused with an aneurysm, especially an aneurysm involving the innominate artery. Kymography enables a differential diagnosis to be made because if the radiogram is taken whilst the patient swallows, a most characteristic picture is obtained. With the act of deglutition the larynx is elevated and the tumour follows it upwards. The result is a series of waves corresponding to the act of swallowing and quite distinct from arterial pulsation.

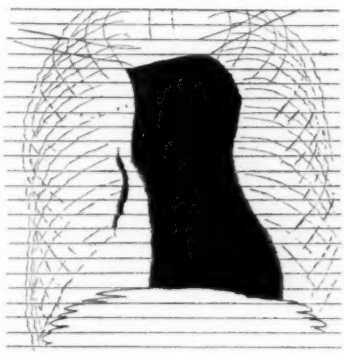
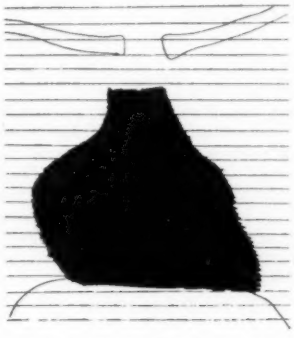


FIG. IX—Tracing of a kymogram of a heart with aneurysm of the aortic arch (confirmed post mortem). The aneurysmal sac on the left side shows absence of the normal pulsations.

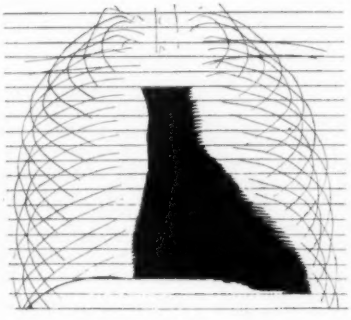
*Displacement of œsophagus.*—It is of value to fill the œsophagus with barium before taking the kymogram since its position can be easily shown if sufficient penetration is used and any displacements noted. The pulsations of the aorta are transmitted to the œsophagus in the region of the aortic arch and also lower down above the diaphragm. In cases of mitral stenosis, displacement of the œsophagus, usually to the right, can be seen, although it must be confessed that a very large heart may prove too dense for the outline of the middle portion of the œsophagus to be shown. Obstruction of the œsophagus by new growth can, of course, be readily shown by means of kymography.

*Myocardial disorders.*—Where the myocardium has been damaged by an infarct, absence of the pulsations can be demonstrated on the radiogram if the outline of the part of the ventricle affected can be shown by rotating the patient into a suitable position. In such a case there will be a localised absence of movement. With an extensive lesion and a definite aneurysm of the left ventricle, more obvious changes can be seen.

VI



VII



VIII

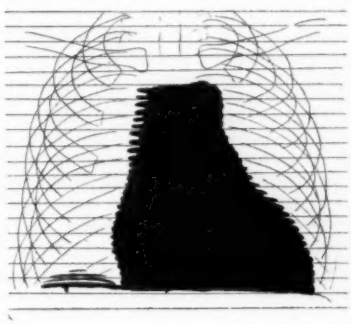


FIG. VI—Tracing of a kymogram of a heart with advanced mitral stenosis and auricular fibrillation. The right border is obscured by congestion in the lung. The left auricle is prominent and shows irregular pulsations. The normal ventricular pulsations alternate with a smaller medial movement in diastole.

FIG. VII—Tracing of a kymogram of a heart with aortic regurgitation of rheumatic type. The ventricular pulsations are of type II (see fig. II). The waves are considerably exaggerated on the left border of the aortic arch.

FIG. VIII—Tracing of a kymogram of a heart in a man, aged 56, with aortic regurgitation associated with hypertension and syphilitic aortitis. The pulsations are well marked on the upper part of the right border of the heart.

The following is an example of left ventricular aneurysm.

A man aged 65 was admitted to hospital under Dr. Shirley Smith complaining of cough and shortness of breath on exertion. Four years previously he had an attack of intense precordial pain with malaise and sweating. The Wassermann reaction was negative, the electrocardiogram showed regular rhythm, P–R interval normal, notched Q R S in leads I and II, and inverted T waves in leads I, II, and III. The blood-pressure was 118/76. On screen examination and in anterior and oblique radiograms a circular opacity was visible in the region of the apex of the left ventricle, which was thought to be part of the heart shadow. The kymogram is shown in fig. V on plate. It will be noted that normal pulsations are visible on the left border of the heart until we come to the protuberance at the apex where they cease abruptly. A faint wavy outline can be seen in this area which is probably due to a deposit of calcium in the sac of the aneurysm. Transmitted pulsations are visible in the ribs on both sides of the chest wall. There is a double line of pulsations in the upper part of the right border of the heart apparently due to the superior vena cava externally and the aortic arch more internally.

*Disturbances of rhythm.*—Kymography cannot compete with electrocardiography in the demonstration of disturbances of the rhythm. Very rapid movements cannot be shown, and too few pulsations are registered on one film. With a pulse-rate of 60 and an exposure time of three seconds, only three cardiac cycles are registered; while with a pulse-rate of 120 six complete cycles will be shown, but in this case the wave form will be very narrow and difficult to read.

*Pericardial lesions.*—The kymograph has a definite value in illustrating lesions of the pericardium. Where fluid is present there is an absence of normal pulsations and a definite enlargement of the heart shadow, the appearance being fairly characteristic. Sometimes it may be possible to separate the heart shadow from the fluid, but this is unusual. A deposit of calcium in the pericardium is fairly easy to detect and where it is extensive its influence on the heart movements can be seen.

## CONCLUSIONS

It will be appreciated from the above rather brief description that kymography has a very wide application in the radiology of the heart. It can replace teleradiography since with a suitable apparatus a film can be taken at a distance of six feet which will show not only the outline of the heart but also the character of the pulsations in each part of the heart border. It enables us to assess the enlargement of the different chambers of the heart and the size and condition of the aorta. We can also separate extraneous shadows from the heart and great vessels. It is of considerable value in lesions of the pericardium, and in the examination of the œsophagus. It is recommended as an accessory but very useful apparatus in the radiological examination of the heart and lungs.

I should like to take this opportunity of acknowledging the valuable assistance which I have received from my colleagues at the London Chest Hospital during this investigation.

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# TREATMENT OF PNEUMONIA WITH M. & B. 693

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*With Bacteriological Observations by*

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M. &. B. 693, or 2-sulphanilyl-aminopyridine, is a recent preparation, which has been shown by Whitby (1938) to be active against pneumococcal infections in mice. Its action was further investigated by Fleming (1938), who demonstrated that the drug had a bacteriostatic but no bactericidal effect in concentrations likely to be reached in the body. Clinical trials were made by Evans and Gaisford (1938) on 100 cases of lobar pneumonia with very favourable results, and more recently Reid (1938) and Robertson (1938) have reported cases in which recovery from pneumococcal meningitis followed its use.

An investigation has been carried out in the Native Hospital, Nairobi, on 100 native cases of pneumonia, admitted between the end of August and the beginning of November, 1938. Of these 50 were treated with M. & B. 693 and the remainder were given the customary non-specific treatment. The only selection of patients which was made was to reject those dying within twenty-four hours of admission, and those who had been ill for more than five days before admission. In the former class, 2 were in the treated group and died four and six hours after admission, and 3 were in the control group. Patients who had been ill for more than five days before admission were not included.

It was intended to allot patients alternately to the treated and control groups as they were admitted; owing, however, to a delay in obtaining supplies of M. & B. 693, 25 consecutive cases in the middle of the series were taken as controls, followed by 25 in the treated group; otherwise the original programme was followed. The diagnosis in every case was based on the history, a blood-stained or rusty sputum, and the finding of a small area of tubular breathing, not necessarily complete lobar consolidation.

## DOSAGE

The dosage employed was similar to that recommended by Evans and Gaisford—namely, 2 half-gramme tablets every four hours with an initial dose of 4 tablets (2 g.). A reduced dose was given to children according to age. Administration was continued for twenty-four hours after the temperature became normal, except in a few cases in which there was a slight rise of temperature in the second week. The largest total quantity given to a single patient was 40 g., the average being 18·5 g.

Table I shows broadly the total doses used.

TABLE I—DOSAGE

| *Total dose (g.)* | *Under 10* | *10–14* | *15–19* | *20–24* | *30–34* | *35+* |
|---|---|---|---|---|---|---|
| No. of patients | 2 | 20 | 13 | 6 | 4 | 5 |

No remedy was given in addition to the M. & B. 693 except an occasional aperient; sulphur-containing aperients were avoided.

### SEX- AND AGE-INCIDENCE AND DAY OF ADMISSION

Pneumonia is relatively uncommon among native women, and there were only 2 female patients in the treated group and 4 in the control group. There were 6 children below the age of eighteen, the youngest being eight. The majority of subjects in both groups were young men between the ages of twenty and thirty; the oldest patient was about forty-five. The average age was twenty-six in the treated group and twenty-five in the control group.

Table II shows the age-distribution in the treated and control groups.

TABLE II—AGE-DISTRIBUTION

| | *Under 20* | *20* | *25* | *30* | *35* | *40 or 45* | |
|---|---|---|---|---|---|---|---|
| Treated .. | 5 .. | 7 .. | 18 .. | 14 .. | 3 .. | 3 .. | 50 |
| Control .. | 5 .. | 10 .. | 22 .. | 11 .. | 1 .. | 1 .. | 50 |

These figures are only approximate, as few natives know their age.

The two groups are roughly comparable as regard the day of illness on which they were admitted (table III).

TABLE III—DAY OF ILLNESS ON WHICH PATIENT WAS ADMITTED

| Day of admission | 1 | 2 | 3 | 4 | 5 | — |
|---|---|---|---|---|---|---|
| Treated .. | 4 | 11 | 20 | 8 | 7 | 50 |
| Control .. | 6 | 15 | 16 | 12 | 1 | 50 |

It will be noted that the control group has a slight advantage both in younger age and earlier admission.

### FATALITY-RATE

There were 8 deaths in the control group, a case-mortality of 16 per cent., which is a rather low figure. The mortality from pneumonia in the Native Hospital, Nairobi, during the six years 1932–37 was 22 per cent. With the addition, however, of the 3 cases in which death occurred during the first twenty-four hours, and which were excluded from the control group, the death-rate in this series equals the average.

There was only 1 death in the treated group.

The patient, a woman aged about twenty-five, was admitted on the second day of the illness with a consolidation of the right lower lobe. A type I pneumococcus was cultured from the sputum. Two days after admission to hospital she became delirious, and vomiting began on the third day to such a degree that the administration of M. & B. 693 was seriously interfered with. The temperature varied between 99° and 101° F. and was normal for four days before death, which occurred on the ninth day. The pulse-rate did not fall with the temperature, and death was probably caused by heart failure. No post-mortem examination could be obtained. There was no granulopenia, and it seems unlikely that death was due to the effects of the drug.

### EFFECTS OF TREATMENT

One of the most remarkable effects of M. & B. 693 was its modification of the temperature chart. In many of the cases in the control group the temperature first reached normal at the crisis. In the treated group, however, the temperature first fell to normal within twenty-four hours of the commencement of treatment in 26 cases, and within forty-eight hours in 44. In every case the temperature first reached normal within three days, as shown in table IV.

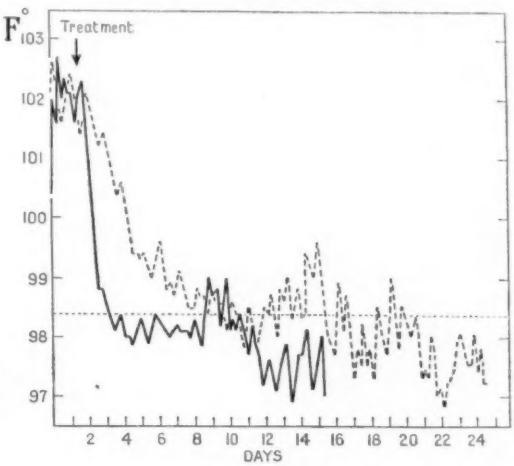
After the initial fall there was a secondary rise of temperature in less than half of the treated cases. This secondary rise was generally only small, to not more than 100° F. Less frequently there was a considerable secondary rise of temperature which was almost always associated with an extension of consolidation in the lung. In the treated group such extension was noted in 7 cases; in the control group extension was found in 23 cases.

TABLE IV—DAY (AFTER COMMENCEMENT OF TREATMENT) ON WHICH TEMPERATURE FIRST REACHED NORMAL (TREATED CASES)

| *Day* .. | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *Later* .. | Aver. days |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cases .. | 26 | 18 | 5 | | | | | | | | .. | 1·6 |

TABLE V—DAY ON WHICH TEMPERATURE FINALLY REACHED NORMAL (TREATED CASES)

| *Day* .. | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *Later* .. | Aver. days |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cases .. | 15 | 11 | 6 | 2 | 3 | 4 | 1 | 1 | | 4 | 1 .. | 3·5 |




The mean of the temperatures of the treated group (continuous line) and the untreated (interrupted line).

The figures shown in tables IV and V are not strictly comparable with the control group, for in 22 cases M. & B. 693 was not given at once but was withheld until unequivocal signs of pneumonia had developed. The number of days that elapsed before the temperature first reached normal and finally fell to normal, from the time the patient was admitted, are shown in tables VI and VII.

TABLE VI—DAY ON WHICH TEMPERATURE FIRST REACHED NORMAL (TREATED AND CONTROLS)

| *Day* .. | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *Later* .. | Aver. days |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treated | 13 | 26 | 8 | 1 | | | | | | | .. | 1·9 |
| Control | 4 | 6 | 4 | 4 | 10 | 4 | 6 | 1 | 2 | | 1 .. | 4·8 |

TABLE VII—DAY ON WHICH TEMPERATURE FINALLY REACHED NORMAL

| *Day* .. | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *Later* .. | Aver. days |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treated | 5 | 16 | 11 | 2 | 1 | 4 | 3 | 1 | | 2 | 3 .. | 4·0 |
| Control | | 2 | 3 | 2 | 7 | 1 | 7 | 4 | 2 | 5 | 9 .. | 8·2 |

The accompanying figure shows the mean of temperatures in the treated and control groups; the arrow indicates the average time after admission at which administration of M. & B. 693 was begun.

The area of the curve above the normal line in the treated group was 1066 sq. mm., and that enclosed by the control group 2114 sq. mm.

In tables V–VII fatal cases have been excluded, also two cases, one in each group, in which intercurrent affections supervened, necessitating a prolonged stay in hospital. The average number of days spent in hospital by patients in the treated group was 7·5, compared with 11·9 days in the control group (see table VIII).

TABLE VIII—DAYS SPENT IN HOSPITAL (RECOVERED CASES)

| Days | 4–6 | 7–8 | 9–10 | 11–12 | 13–14 | 15–16 | 17 + | Total |
|---|---|---|---|---|---|---|---|---|
| Treated .. | 24 | 14 | 4 | 0 | 3 | 3 | 1 | 49 |
| Controls .. | 1 | 7 | 12 | 6 | 8 | 2 | 6 | 42 |

### COMPLICATIONS AND TOXIC EFFECTS OF THE DRUG

Only 3 cases in the series developed serious complications. One patient in the treated group ran a temperature for twenty-five days owing to an abscess of the buttock following an injection of quinine given before admission to hospital. In the control group one patient in whom delayed resolution occurred developed a parotid abscess, mental symptoms, incontinence of urine and fæces, and bed-sores and died three months later. One case in the control group developed an empyema.

Vomiting occurred in 12 of the treated cases, but was sufficiently severe to interfere with treatment in only one—namely, the patient who died. Cyanosis was met with in 2 cases in which larger doses had been given. This symptom is not easy to recognise in natives and it is possible that minor degrees were overlooked.

No case of granulopenia was observed in the treated group. Differential leucocyte counts were done on successive days during treatment in 8 cases. In these there was a moderate fall in the percentage of polymorphonuclear leucocytes. The lowest recorded figure was 32 per cent.

### NOTE ON THE BACTERIOLOGY

(DR. DOWDESWELL)

*Technique.*—Specimens of sputum were sent to the laboratory as soon after the patients' admission to hospital as possible. Half a cubic centimetre of an emulsion in saline was injected intraperitoneally into mice and cultures made from the heart blood, when the mouse was moribund, usually within twenty-four hours. Typing of pneumococci by agglutination was done in the usual way with formalinised saline suspensions of eighteen-hour cultures on blood-agar or peritoneal wash suspensions after preliminary centrifugalisation to throw down cells. Bile-solubility tests were done on each strain. Antisera for the nine most prevalent types in Kenya were used: those pneumococci not of one of these types are grouped as "unclassified."

The results obtained from the sputa of 95 of the cases described above are shown in table A.

The percentage incidence of types among the 90 strains recovered from 87 cases from both the treated and untreated groups is shown in table B.

TABLE A

| Organism | | Group treated with M. & B. 693 | Untreated group | Total | Remarks |
|---|---|---|---|---|---|
| Pneumococcal types | I | 8 + 1(*a*) | 11 + 1(*b*) | 19 + 2 | 1 death in treated group, 4 deaths in untreated group |
| | II | 1 | 3 | 4 | — |
| | III | 2 | 0 | 2 | — |
| | V | 3 | 6 | 9 | — |
| | VII | 3 | 0 | 3 | — |
| | VIII | 1 | + 1(*c*) | 1 + 1 | — |
| | XIV | 1 | 0 | 1 | — |
| | XV | 0 | 0 | 0 | — |
| | KwV | 1 | 0 | 1 | — |
| Unclassified .. | | 21 | 22 | 43 | 1 death in untreated group |
| Streptococci .. | | 3 | 0 | 3 | — |
| *H. influenzæ* .. | | 0 | 1 | 1 | — |
| No result .. | | 4 | 4 | 8 | — |
| Total .. | | 49 | 49 | 98 | — |

(*a*) Recovered from abscess in a patient whose sputum yielded streptococci.
(*b*) Recovered from empyema in a patient whose sputum yielded an "unclassified" type of pneumococcus.
(*c*) Found in association with pneumococcus type I in the sputum.

TABLE B—INCIDENCE PER CENT.

A = This series. B = De Smidt's series.*

| Series | Pneumococcal types | | | | | | | | | Unclassified | Streptococci, &c. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | V | VII | VIII | XIV | XV | KwV | | |
| A .. | 23·0 | 4·4 | 2·0 | 10 | 3 | 2·0 | 1 | 0 | 1 | 48·0 | 4·4 |
| B .. | 21·5 | 8·25 | 8·25 | 6 | 7 | 9·5 | 3 | 3 | 3 | 30·5 | — |

*These results are taken from unpublished work by Dr. F. P. G. de Smidt, who investigated over 800 specimens from pneumonias in Nairobi between 1929 and 1935 and isolated 24 pneumococcal types.

In view of Whitby's (1938) findings on the action of M. & B. 693 on the different pneumococcal types in infected mice it would be interesting to see if the same differences occur in pneumonia in man. In this very small series the times elapsing between commencement of treatment and the final fall of the temperature to normal among those 12 patients yielding types I, VII, and VIII and those 6 patients yielding types II, III, and V averaged 4·1 days and 2·4 days respectively, which is not in accord with the results of the mouse experiments. However, it is clearly quite impossible to gauge the therapeutic activity of the drug in relation to the different pneumococcal types with such small numbers as we have here, and in the presence of the many undetermined factors that must be present in clinical cases.

### SUMMARY

1. The results of treatment in 50 cases of pneumonia with M. & B. 693 are compared with the results in 50 cases which were given non-specific treatment.

2. There were 8 deaths in the control series, compared with 1 in the treated series.

3. The course of the disease was considerably modified by the drug, and the pyrexial period was reduced in the treated group.

4. In the small series under review it has been impossible to correlate clinical findings with different pneumococcal types. The drug appeared to be active against all types.

We are indebted to Dr. de Smidt for permission to quote his results; to Mr. J. S. M. de Souza for the work he has done on typing pneumococci; to Mr. A. Walter, formerly statistician to the Governors Conference, for statistical help; to Dr. J. I. Roberts for examinations of the blood; to the Director of Medical Services of Kenya for permission to publish this paper; and to Messrs. May and Baker for a supply of the drug sufficient for the treatment of 50 cases.

(*Continued at foot of opposite page*)

# CHRONIC CONSTRICTIVE PERICARDITIS

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(WITH ILLUSTRATIONS ON PLATE)

THE surgical treatment of constrictive pericarditis is slowly being adopted. Only a few accounts of the experiences of physicians and surgeons in their combined efforts in treating this disease are as yet available in this country. We feel that all information on the subject may be helpful, both in drawing attention to these cases and in throwing light on the risks, complications, and results of pericardiolysis.

The following is an account of three cases treated at King's College Hospital. Before giving the case notes we should like to discuss certain points that arose as the result of our experience with these cases.

### PRELIMINARY MEASURES

All the patients were given considerable periods of rest in bed in hospital before operation. When ascites was present it was controlled either by Salyrgan or by tapping, and as much fluid as possible was got rid of before operation. This last seems an important point, for in case 2 the operation had to be abandoned at the first attempt after the skin incision, owing to respiratory embarrassment, and we thought that this was produced by the ascites; before a second attempt as much fluid as possible was withdrawn.

### ANÆSTHETIC

The question of anæsthesia appears to us also of great importance; in case 1 and at the first operation in case 2 Avertin, gas and oxygen, and ether were used, but after the respiratory embarrassment above-mentioned it was thought that a basal anæsthesia was too depressing; in the subsequent operation and in case 3 a plain open ether preceded by morphia was used and proved most satisfactory. Apart from the first operation on case 2, the anæsthetic gave no undue anxiety, and it was most noticeable how little the patients were affected during operation.

### OPERATION

A new exposure of the pericardium was used and found to be very satisfactory. A curved incision was made, starting in the middle line of the sternum about 1 in. below the sternal notch and carried outwards towards the left nipple, sweeping back to end just across the middle line at the xiphisternum. The skin-flap thus marked out was turned to the right. Portions of the second to the sixth costal cartilages were carefully removed after the perichondrium had been stripped. A sternum-splitting chisel was introduced at the right border of the xiphisternum and the sternum divided as far as the second interspace; a cross division was then made to the middle line from the second interspace. The sternal flap thus marked out was turned to the left as an osteoplastic flap, giving a wide exposure of the pericardium and the edges of the pleuræ (fig. I).

The pleuræ were stripped back from the pericardium by gauze dissection. In all cases it was noticed that there were fine extrapericardial adhesions, and it would seem important that these should be separated far round to the left side before opening the pericardium, for it makes the subsequent removal of the pericardium much easier and more extensive.

Exposure of the pericardium showed at once the constrictive effect on the heart, for, although pulsations were visible, they were very much smaller than those seen on exposing the pericardium in the preliminaries of cardio-omentopexy.

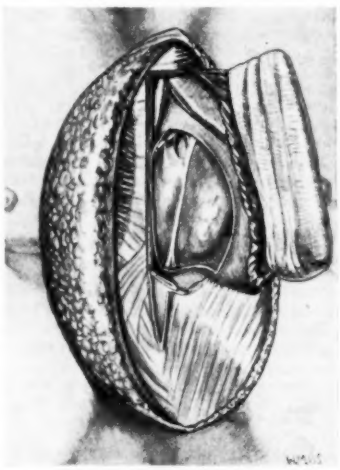

FIG. I—Heart exposed, with skin-flap turned to right and osteoplastic flap (sternum) to left, showing fibrous band (found in case 2) running from right auricle, across right ventricle, to diaphragm.

After free exposure of the pericardium an incision was made into it with great care and a line of cleavage sought. The difficulty of doing this varied considerably in the different cases. When a portion had been freed, that portion was removed and a fresh portion separated, the pericardium being removed piecemeal. Removal of the pericardium was carried out over the anterior and left side, as far on the right as possible, and in an upward direction. No special attempt was made to free the inferior or superior venæ cavæ.

In all cases a definite increase could be seen in the force of the heart-beat, and the heart at the end of the operation was apparently larger.

### COMMENT

We are of the opinion that the symptoms of the disease are produced by the mechanical effect on the ventricles; these, being constricted, cannot fill to their capacity, thus producing a back-pressure effect on the auricles and a rise in venous pressure; this may affect the inferior vena cava in particular. The effect on the circulation is to slow the rate of the flow of blood between the arm and the lung. Other observers have demonstrated that the cardiac output is low and cannot be raised to the usual extent on exertion (Burwell and Strayhorn 1932). The stroke volume is actively reduced—it may be to 60 per cent. of normal (Burwell and Flickinger 1935).

### FIRST CASE

A clerk, aged 34, was admitted to King's College Hospital in May, 1935, suffering from acute pericarditis. No effusion developed. There were no symptoms of rheumatism and no pleurisy. After several weeks the patient made a good recovery. The physical signs of the heart were then normal. The electrocardiogram then showed nothing of importance.

(*Continued from previous page*)

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Whitby, L. E. H. (1938) *Ibid*, **1**, 1210.

Towards the end of 1936 he began to have swollen ankles and pain and swelling of the abdomen. The tendency to œdema increased. By this time the diagnosis of Pick's syndrome resulting from pericardial constriction was obvious. Slight cyanosis was visible in hands, lips, ears, and feet. The ankles were slightly œdematous. Ascites was present. The fluid was a transudate. The liver was not enlarged. The veins in the neck, particularly on the right side, were engorged 8 cm. above the clavicle when the patient was reclining at 60°. They showed little pulsation but swelled on inspiration.

The heart was not enlarged in the transverse diameter (14 cm.) as against 29 cm. for the lung field, but there was some increase in the right median diameter (6 cm.) compared with the left (8 cm.), apparently due to enlargement of the right auricle. No calcification could be found. The systolic movement of the apex was slight. There were pleuropericardial adhesions at the apex. The heart sounds were normal; there were no murmurs. The pulse was not paradoxical. The blood-pressure was usually low, about 115/75. The pulse-rate remained normal.

Observations of the circulation-rate gave the following results: arm to carotid sinus (cyanide) 22 sec. (average normal, 15 sec.); arm to lung (ether) 17 sec. (average normal, 10 sec.). These results showed that the delay in circulation lay between the arm and the lung capillaries.

The urine was normal; the concentration of urea (MacLean and de Wesselow) and the blood-urea were normal. The Wassermann reaction was negative. The blood-count was normal. The accumulation of ascites was kept under control by salyrgan, to which he responded well.

*Operation.*—Pericardiolysis was done on March 2, 1937, under avertin, gas and oxygen, and ether, and the pericardium was exposed as described above. Once the pericardial sac had been removed from the front of the heart, the ventricle swelled upwards at each diastole well above the bounds within which the sac had formerly limited it. It was a most convincing demonstration of the constricting effect which this form of pericarditis had produced. It seemed that the pericardial sac had shrunk and was now too small for the heart and thus limited its diastolic expansion and filling.

*Subsequent course.*—Fever persisted for ten days. Fluid collected under the flap and had to be aspirated repeatedly for a fortnight. Soon after operation pleural frictions were audible over both lungs in front. A large effusion developed in the right pleural sac and persisted for ten weeks. The reaccumulation of fluid was partly checked by air-replacement after paracentesis. In the sixth week there were pain in the back and transient hæmaturia, probably from a renal infarct.

Later the jugular veins were normal and did not fill on abdominal pressure. Cyanosis had gone, and the patient was free from œdema and ascites seven weeks after operation. Before he left hospital in the twelfth week, the circulation-rate was tested again with these results: arm to carotid sinus (cyanide) 18 sec. and 18½ sec.—two readings (average normal, 15 sec.); arm to lung (ether) 9½ sec. and 12 sec.—two readings (average normal, 10 sec.). Compared with the results obtained before operation, it is indicated that the delay between arm and lung capillaries had disappeared. The vital capacity was 3480 c.cm. After the operation a diastolic rebound could be felt over the third left interspace. There was no change in the size or outline of radiograms of the heart. Section of the pericardial sac showed dense fibrous tissue, in which were cells containing free iron. The electrocardiogram, taken before operation, showed —1·5 mm., T negativity in leads II and III. After operation $T_1$ became negative and $T_3$ iso-electric. The voltage of R was unchanged ($R_1 = +5$ mm., $R_2 = +7$ mm.).

Eighteen months after operation the patient is back at work and living an ordinary life, free from any disability.

In this case the symptoms of Pick's syndrome, due to constrictive pericarditis, came on fifteen months after an attack of pericarditis of obscure origin. Cardiolysis gave complete relief. Pleural effusion on the right side and a renal infarction were complications.

### SECOND CASE

A dressmaker, aged 21, had had acute pericarditis in April, 1933. Paracentesis had to be done several times. At first the fluid was bloodstained, later clear yellow. In the summer of 1934 ascites developed. At this time there was moderate cyanosis. The external jugular veins were considerably distended. The heart was not enlarged. There were no murmurs, but the pulmonary second sound was reduplicated. Blood-pressure was 110/64. The liver was not enlarged. Paracentesis of the abdomen was done. The tendency to reaccumulation of fluid seemed to diminish until the summer of 1935, when the abdomen had to be tapped again. After this she was able to resume her work but relapsed again in 1937.

The physical condition was much as before. The external jugular veins showed inspiratory filling. The liver was not enlarged. There were considerable cyanosis and slight clubbing of the fingers. There was much ascites, but œdema of the feet had never been conspicuous, though the feet were always blue and cold. There was no paradoxical pulse. The left lung was poorly expanded at the base; hence the heart was a little displaced to the left. The transverse diameter of the heart was 11·5 cm. and of the lung fields 27 cm.

The electrocardiogram showed low voltage. Estimation of the circulation-rate gave normal results: arm to carotid sinus (cyanide) 18 sec.; arm to lung capillary (ether) 8 sec.

The von Pirquet reaction was strongly positive. There was a short attack of dry pleurisy on the left side.

It was realised that the patient was not a good operative risk, but it seemed that pericardiolysis was indicated. Repeated tapping of the abdomen gave temporary relief, and for a time the disability remained stationary, but latterly it tended to increase. She had reacted badly to salyrgan on one occasion. After the first operation she responded well to salyrgan, when veins could be found, and rather erratically to Novurit suppositories.

The operation had to be abandoned at the first attempt because the breathing became so bad. In this case avertin was probably not the suitable anæsthetic.

Owing to the shrinking of the left lung and the high diaphragm on the right side the vital capacity was low: 1300 c.cm. before paracentesis of abdomen and only 1700 c.cm. when the abdomen was empty.

*Operation.*—Pericardiolysis was done on June 8, 1937, under open ether preceded by morphine sulphate gr. ¼. When the pericardium was exposed, the heart-beats were slight. The pericardium was carefully incised, and many very fine adhesions found inside were freed upwards towards the right auricle. Irregularity of the beat followed this procedure, but the rate settled almost at once. The pericardium was removed piecemeal round to the left side and downwards to the diaphragmatic surface, where the adhesions were dense. A very stout adhesion running down from the right auricle to the diaphragmatic surface (fig. I) was so stout that the heart bulged on either side of it; no calcification was found.

Soon after operation pleurisy developed on both sides, going on to effusion on the right side. Since the operation there has been less cyanosis, and the external jugular veins have been less engorged. Ascites still recurs, and paracentesis has to be done from time to time. There has been no change in the signs of the heart. The radiogram shows no change in the transverse diameter (11·5 cm.). Section of a piece of the pericardial sac showed only fibrous tissue and a little round-cell infiltration. Possibly tuberculosis caused this pericarditis.

The symptoms of Pick's syndrome here developed about a year after acute pericarditis of obscure origin. Pericardiolysis gave only a little relief to the area drained by the superior vena cava. Pleurisy with effusion developed on the right side.

### THIRD CASE

A slate tiler, aged 42, who was a well-built man and used to carrying 3–4 tons of tiles daily, complained of shortness of breath and substernal pain, preventing him from doing his work. He had noted also palpitation, exhaustion, and giddiness. There was nothing important in his past history.

There was no venous engorgement, inspiratory filling of external jugulars, cyanosis, or œdema. The apex-beat was normal in site, extent, and force, and there was slight systolic retraction in the fifth left interspace. The sounds were normal. Screening showed an amplitude of 0·75 cm. movement at the apex. The lateral movement of the heart on bending sideways was very slight. The pericardial sac was calcified in small granular masses (fig. II on plate).

The electrocardiogram was normal, except for a P–R interval of 0·20 sec. The blood-pressure was about 120/70. There was no paradoxical pulse. The rate was usually about 60. Tests of circulation-rate gave these normal results: arm to carotid sinus (cyanide) 16⅔ sec.; arm to lung capillaries (ether) 9½ and 10⅔ sec. (two tests). The vital capacity was 3100 c.cm., or 1820 c.cm. per square metre of body surface, a good result. The right median diameter of the heart measured 4 cm. and the left 8·5 cm., making a total of 12·5 cm. (fig. III). The transverse diameter of the lung fields was 28 cm.

*Operation.*—Pericardiolysis was done on June 22, 1937, under open ether preceded by morphine sulphate gr. ¼. The pericardium was exposed. Calcification was found on palpation over the auricles and to the right. The pericardium was carefully incised and gaped immediately, giving the impression that the heart was bulging. Some irregular beats were noted at this time, but the rate soon became regular. The pericardium was removed piecemeal upwards towards the auricles and round behind the left ventricle. As usual, the orientation of the various chambers was uncertain, and the suggestion was that the heart was rotated. Very little calcification was found, and this was in the form of plaques.

*Subsequent course.*—Pleurisy developed on the right side, but without effusion. Later there was mild bronchopneumonia. Fever lasted a fortnight. Extrasystoles caused bigeminy on the fourth day and were followed by auricular fibrillation. Later on this was abolished by quinidine.

Two months after operation estimations of the circulation-rate gave: arm to carotid sinus (cyanide) 15 sec.; arm to lung capillary (ether) 7⅔ sec. The right median diameter of the heart measured 6 cm. and the left 8 cm., making a total of 14 cm. (fig. IV). The transverse diameter of the chest was 28 cm.

The electrocardiogram showed smaller deflections than before, but of normal form. Vital capacity was 2400 c.cm., or 1590 c.cm. per square metre of body surface.

The patient left hospital two months after operation.

In this patient the pericardial sac was calcified. The increase in the size of the heart after operation shows that there was probably some constriction. The venous congestion of Pick's syndrome, however, had not yet developed. It seemed right to operate at an early stage, for symptoms had begun to prevent work. He can now get about actively without symptoms. In this case the complications were pleurisy, bronchopneumonia, and auricular fibrillation.

### DISCUSSION

Case 1 and case 2 presented the characteristic symptoms of Pick's syndrome. In case 2 the tendency to ascites was more pronounced than the œdema of the legs. In case 1 there were both œdema and ascites. In case 3 the syndrome had not developed. The diagnosis was given by the radiogram showing calcification in the pericardial sac. The increase in the size of the heart's shadow after operation is held to indicate the need for pericardiolysis.

*Ætiology.*—The pericarditis in case 1 was of unknown origin. In case 2 it may have been tuberculous, for the effusion was hæmorrhagic. There is no history in case 3 to throw light on the cause of the calcification, but some calcified glands in the roots of the lungs suggest tuberculosis.

The symptoms of Pick's syndrome in case 1 and case 2 took about a year to develop after the acute pericarditis.

*Jugular venous engorgement* was conspicuous and showed the usual increase on inspiration. Pulsation in the veins was not conspicuous. Enlargement of the liver was not pronounced.

*Size of the heart.*—There was no cardiac enlargement in these patients. It is worth noting that in case 1, in which the constrictive effect of the shrunken pericardial sac was so obvious at operation, the heart's shadow showed no enlargement later.

*Circulation-rate.*—In case 1 there was delay between the arm and the lung. This became less after operation. In case 2 there was no delay, although there was much congestion. In case 3, which showed no congestion, the results were almost the same. More information is needed to explain these discrepant results. Both Roberts's cases showed delay between arm and lung (Roberts 1937).

*Electrocardiogram.*—Low voltage was noted in case 2. Inversion of $T_1$ followed operation in case 1.

*Urinary output* in case 1 averaged between 20 and 21 oz. daily before operation, but the intake was restricted. After operation it rose to between 40 and 60 oz. daily. In case 2 the low average of 20 oz. persisted after operation. Case 3, which had no congestion and an average of 40 to 60 oz., showed a definite rise to 80 to 100 oz. after operation, although the intake remained unchanged.

*Complications.*—Case 1 had persistent serous effusion from the wound at first and a pleural effusion on the right side. Case 2 developed bilateral pleurisy, with effusion on the right side. Case 3 had pleural effusion on the right side and transient auricular fibrillation.

An oxygen tent was used after operation for all three patients.

### RESULTS

In case 1 the cure appears to be complete; in case 2 the relief is only partial; in case 3, in which venous congestion had not developed, there is improvement. It remains to be seen whether he can do as heavy work as he did before his symptoms began.

### SUMMARY

(1) A new surgical approach for pericardiolysis is described. (2) The results are given of pericardiolysis in three patients, of whom two had developed chronic constrictive pericarditis (Pick's syndrome) about a year after acute pericarditis and the third showed on radiography calcification in the pericardial sac although the syndrome had not developed. (3) All three patients had pleurisy with effusion after operation. (4) Of the patients with Pick's syndrome, one is apparently cured and the other only partly relieved. The third, in whom the syndrome did not develop, is improved.

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# OSSIFICATION OF THE VERTEBRAL BODY

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(WITH ILLUSTRATIONS ON PLATE)

THERE are two schools of opinion about ossification. According to Keyes and Compere (1932) and Mau (1931) the primary centre of ossification appears at the 24th week of intra-uterine life, dividing the primitive *Anlage* into two cartilage plates. By the continued growth in these plates enchondral bone is formed from the age of 6 till growth ceases at 17–20 years in females and 20–25 in males. This process extends over the entire superior and inferior surfaces of the vertebral body but is limited peripherally by a ring overlapping the lateral and anterior borders of the osseous vertebræ. The final ossification does not extend beyond the regions of the epiphysial ring, the remaining part of the plate, which is enclosed by the ring, becoming blended with the fibro-cartilaginous envelope of the disc. The formation of enchondral bone stops simultaneously in all regions.

The other view is held by Schmorl (1928a and b) and Beadle (1931). They maintain that the epiphysial ring mentioned by Fick (1911) and called the *Randleiste* by Schmorl has no place in the scheme of ossification of the body but exists as a fixation organ which maintains the position of the intervertebral disc.

Both Mau (1927) and Scheuermann (1920) when describing juvenile kyphosis believed that the wedge-shaped bodies were the sequel to deficient or unequal growth in the epiphysial line and therefore considered the ring a growth organ. Schmorl (1928b) described two cases which seemed to disprove this theory.

A man aged 33, blown up in the war in 1915, suffered from pain in the back afterwards. He died in 1928 from pulmonary tuberculosis. His spine was removed at autopsy and, when macerated, showed a portion of the epiphysial ring 2–6 mm. in size separated from the rest by two grooves. A groove was also seen in the middle of this fragment on the anterior exterior surface of the vertebra: the piece was separated 0·5 cm. under the edge by a gaping furrow convex downwards and 2 mm. wide. On the edges of the furrow was a bony jagged margin above; the fragment was separated from the upper surface by another gaping furrow 3 mm. wide and 6 mm. deep. When the accident took place the man was 20 and presumably still had an active epiphysis. Growth was not yet closed, but the injury had obviously caused no disfigurement of the spine such as might have arisen from a defect in growth.

By a coincidence one patient in my series has a similar history.

Serving in the war in an infantry regiment, he was blown up by a mine in 1917. Shortly afterwards he was discharged with a kyphosis. He was at this time 22 years old. His kyphosis became stationary when he was 26, but since then he has complained of periodic pain in his back. The patient, now 40 years old, presents the clinical features of old adolescent kyphosis. The deformity is a fixed kyphosis of mid-dorsal region. There is no tenderness on palpating the spinous processes. The radiogram shows (lateral view) wedging of dorsal vertebræ 5, 6, 7, 8, and 9, thinning of the intervertebral discs, anterior lipping of the bodies of dorsal vertebræ 5, 6, 7, 8, 9, and 10, and bridging by bone of 6–7, 7–8, and 8–9, with calcification of two intervertebral discs (fig. I on plate).

Here is a case with an essentially similar history which seems to prove that injury to the epiphysial rings can cause disturbance of bone formation.

Schmorl's second case is that of a girl aged 22, who died from "post-abortion pyæmia." At the age of 18 she had fallen from a hay-cart. A tear of the epiphysial ring on the upper anterior aspect of the third lumbar vertebra was discovered at autopsy. A similar fragment was found on the second lumbar vertebra. As Beadle (1931) remarks, this cannot be taken as an epiphysial break, for union is common in girls at the age of 17 or earlier. This girl had no deformity during life.

It is interesting that in 8 per cent. of the cases seen by me the deformity was attributed to an injury of the back.

The views of Schmorl (1928a and b, 1930) and Beadle (1931) diverge in many details from this first theory, the formation and function of the epiphysial ring being discussed from the following viewpoint. Each vertebral body is ossified from two centres. Fusion is rapid, but at birth a layer of cartilage usually surrounds the bodies. Between the body and arch of the vertebra a narrow band of cartilage persists in which a centre appears at the age of 2, forming the vertebral arch. When the primary body centres are fused, the only cartilage which persists is situated at the superior and inferior surfaces of the vertebræ, and this disc or plate overlaps circumferentially. By endochondral bone formation on the inner surfaces of these plates further growth in length takes place. This ossification layer, while presenting the usual microscopic features of bone formation in cartilage, may be interrupted by gaps in the ground substance of the growing layer (Schmorl 1930). The cartilage is split into fibres staining with eosin, or hæmatoxylin if decalcified, which lie parallel to the plane of the cartilage plate embedded in clear fluid, surrounded in parts by degenerate cartilage cells. This appearance is said to be an artefact and due to the shrinkage and precipitation of products of degeneration. These "ossification gaps" extend into the resting cartilage layer and prevent bone formation at these points. They are numerous at the age of 8, when the perforations of the vertebral surface appear. In the adult the gaps leave no trace, but it is suggested that they may give rise to points of weakness in the plates. The macerated vertebral body of a child aged 16 has a different appearance from that of an adult. A series of deep radially cut furrows is seen on upper and lower surfaces extending over the edges, a cogwheel appearance resulting which is especially well seen in the lumbar and sacral regions. This formation is visible at birth and becomes most conspicuous until it reaches a maximum at the age of 10. It then becomes progressively less noticeable and finally disappears between the ages of 21 and 25. A central area always remains smooth.

During the period of their existence the furrows are filled by hyaline cartilage. If the vertebral body is sectioned in the sagittal plane and the cut passes through one of the furrows, the cartilage plate will present two triangular anteriorly placed projections giving a toothed appearance. It is in these triangular portions that the small ossification centres appear as early as the 8th year (females) or 10th year (males). These centres are irregular in their time of appearance in the same plates. The centres join to form a continuous bony ring above and below the respective vertebræ. As soon as the ring forms, bony union

with the body occurs and the furrows on the body are gradually filled up. In females this is complete at 20, in males after 20. The union may be marginally incomplete in the early stages, and a zigzag line marks the line of fusion. Microscopically there is little characteristic in these epiphyses. A small area of calcification appears in the cartilage plate; vessels grow into this centre from the marrow, carrying osteoblasts which lay down thin lamellar bone surrounding narrow spaces. No vascular communications are seen with the perichondrium.

### VASCULAR SUPPLY OF DEVELOPING VERTEBRA

Böhmig (1930) describes the vascular supply of the plate. He states that there is a vascular system on the dorsal and ventral aspects of the cartilaginous body: one artery and two veins, which penetrate the body (median dorsal and ventral arteries of the body). Each vessel branches, one tributary passing superiorly, the other inferiorly, to the neighbourhood of the disc (dorsal and ventral arteries of the disc). Later the two main median vessels, separated by the chordal canal, form two sinuses in the centre of the future vertebral body. The dorsal sinus gives off two arteries (upper and lower axial vessels) supplying the disc, which is therefore nourished by six arteries, three from above, three from below—namely, the ventral, axial, and dorsal branches of the median dorsal and ventral arteries of the disc.

The accompanying lateral radiograms are taken from a series of 200 showing the appearance of the spine in adolescent kyphosis. Since this disease is developed essentially during the period of active spinal growth, some points of importance may be made in a study of spinal ossification.

Fig. II is a lateral radiogram of the spine of a boy, aged 13, with early rigid kyphosis. The ring epiphyses of the spine are seen as small detached seed-like bodies at the anterior angles of the vertebral bodies. At two adjacent angles the bodies project beyond the anterior vertebral body line in a rather sharp convexity. This presumably means bony overgrowth caused by irritation of the epiphyses concerned and initiated by a nuclear prolapse in the disc allowing the axis of motion to be transferred posteriorly to the spinal laminar joints.

If premature ossification is produced, premature closure of the epiphysis is a certain sequel. Fig. III, a lateral radiogram of the dorsal spine of a child, aged 16, with rigid kyphosis, shows that the area of the vertebra in relation to the discs is reduced and the central area of the vertebral body projects anteriorly.

In my opinion fig. II shows that the ring epiphysis is responsible for bone growth in the body of the vertebra in a boundary area probably amounting to 1/32 of the whole, whereas the remaining ossification is by endochondral growth of the vertebral body. The last stage is seen when osteophytes project anteriorly above and below the vertebral bodies (fig. IV). The articular areas are still limited in size.

### SUMMARY

(1) The current views on vertebral body ossification are given. (2) Three cases are quoted which seem to prove that ossification is combined in the vertebral body and the epiphysial ring.

My thanks are due to Mr. J. R. Rocyn-Jones, Mr. Blundell Bankart, and Mr. V. H. Ellis for permission to use their cases, seen by me in the Royal National Orthopædic Hospital.

(*Continued at foot of next column*)

## NEOPLASTIC CYSTS COMMUNICATING WITH THE VENTRICULAR SYSTEM

REPORT OF A CASE

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(WITH ILLUSTRATIONS ON PLATE)

As the incidence of neoplastic cysts communicating with the ventricular system is apparently low, it seems justifiable to report the following case, more particularly because it demonstrates the advantages to be gained by the use of the apparatus and technique perfected by Lysholm et al. (1935).

Eight cases only could be found in a moderately thorough search of the literature, and of these the case reported by André-Thomas, Schaeffer, de Martel, and Guillaume (1932) was not proved neoplastic, although their excellent report admits of little doubt of the malignancy of the pathological process. Another case, not included in the literature, is mentioned by Lysholm in a personal communication, in which he states that in a series of 450 verified tumours examined by ventriculography he has only met with this condition twice.

The earlier cases, reported before the extensive use of air studies of the ventricular system, were usually post-mortem discoveries—e.g., the two cited by Auriat in 1925. Jossman in 1928 published a case in which the diagnosis was suggested by air study and confirmed only at post-mortem, and in 1935 Medea reported another found at autopsy. In the non-proven case of André-Thomas et al. encephalography failed and ventriculography was not attempted, the diagnosis being made at operation.

The only cases reported in which the neoplastic cyst was proved to communicate with the ventricular system are the two described by Cohen in 1936 and the one by Lysholm et al. in 1937. The condition is apparently not confined to any one type of neoplasm, for the cases referred to above include two astrocytomas, one hæmangioma, one cholesteatoma, and an ependymoma. No conclusion can therefore be reached when the characteristic appearances are disclosed by ventriculography, but the majority tend to be slow-growing rather than highly malignant tumours.

The ventriculograms in the case described below bear a remarkable resemblance to those of Cohen's second case, and the pathology of the tumour was the same in the two cases.

### CASE-RECORD

The patient, a man aged 42, gave a history dating back to twenty years ago, when he received a gun-

(*Continued from previous column*)

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shot wound beneath the left clavicle. The superficial part of the wound alone was treated at the time, various pieces of clothing and metal buckle being removed, but the bullet lying beneath the left scapula was left untouched and remains to this day.

Shortly after this injury he had an attack in which a tingling sensation commenced in the ulnar side of the left hand, spreading upwards over the whole of the left arm, downwards over the left side of the trunk, and finally over the whole of the left leg and the left side of the face, neck, and head. The sensation spread over its whole area in less than a minute, was gone in a further minute, and was described as most disagreeable.

Since the original onset twenty years ago the attacks have recurred at short intervals in an exactly similar fashion, always being confined to the left side of the body.

Four years ago, two weeks after the extraction of twenty-five teeth, he had a sudden attack in his sleep of a different character, in which his wife found him "moving his arms and legs and making unpleasant noises." He was unconscious during this attack and remained so for sixty-one hours, during which time he is said to have been suffering from almost continuous fits, although no accurate information is available on this point. Afterwards he had no recollection of this period nor of the original convulsion. For some weeks after this attack he felt rather debilitated but slowly returned to his normal health, although the sensory fits persisted in spite of medicinal treatment continued for two years. Two years ago he began to have "muddled feelings" in his head, pain behind the eyes, and increasing numbers of sensory disturbances in the left side of the body.

Four weeks before admission (Jan. 13, 1937) he had a fit beginning with the usual tingling sensation followed by twitching of the left angle of the mouth, clenching of the teeth, and clonic movements of the left hand and arm. This was the first occasion he could recall of a motor component of the fits. One week before admission an exactly similar fit took place, and on the day of admission another such fit progressed to unconsciousness and was followed by drowsiness and frontal headache.

There were no other symptoms of any kind.

*Neurological examination.*—The patient was a well-built, pale, but healthy-looking man, quite intelligent in conversation, well orientated, and showing no evidence of defective memory or of mental defect. He was right-handed. Apart from a visual acuity of 6/24 on the right side and 6/36 on the left and slight bilateral middle-ear deafness, the cranial nerves were normal. In the upper extremities there was comparative weakness of the left arm, definite wasting of the thenar eminence, and consequent loss of opposition of the thumb on the same side. There were astereognosis of the left hand and hypo-æsthesia to pinprick, light touch, and thermal sensation in the whole of the left arm and hand. Vibration, joint sense, and two-point discrimination were also less perfect on the left side. The left biceps and supinator reflexes were diminished, but the reflexes were otherwise present and normal.

The trunk, in addition to the old gunshot wound below the left clavicle, showed the same sensory diminution to pinprick, light touch, and thermal sensation as in the left upper extremity. The abdominal reflexes were present and normal. The left lower extremity showed hypo-æsthesia to pinprick, light touch, and thermal sensation, and slight diminution of vibration, joint sense, and two-point discrimination. There was no alteration in motor power or reflexes in the lower limbs.

*Lumbar puncture* was performed six days later, the initial pressure being 130 mm. and no abnormality being found in the fluid. The Wassermann reaction was negative in the blood and cerebrospinal fluid.

During the eight days following admission the patient had three fits, all of the last type described in the history.

*Ventriculography* was undertaken on Jan. 22 and gave most valuable information. Both ventricles were tapped, the left side first, and found in the normal position; but, whereas the fluid from the left side appeared normal, that from the right was yellow, clotted on standing, and contained 0·25 per cent. protein and 7 cells per c.mm. Air replacement was carried out, and communication between the two lateral ventricles appeared to be free. The exposures were made with the Schonander apparatus by the technique described by Lysholm.

Fig. I (semi-axial, sagittal, supine) shows a slight ventricular shift to the left and an abnormal air-filled cavity in the right parietal region. Fig. II (axial, sagittal, prone) shows the ventricular shift and a club-shaped air-filled cavity, the communication between ventricle and cyst being particularly well demonstrated in this view and in fig. V (semi-axial, sagittal, prone). Figs. IV (lateral prone), III (lateral sitting), and VI (lateral left side to film) show varying aspects of this same communicating cystic cavity and confirm its exact position and ramifications. A large series of exposures was made in this case, and it was quite simple, by careful manipulation, to empty or fill the cyst with air at will, so that no doubt of its communication with the lateral ventricle could be entertained.

*Preoperative diagnosis.*—In view of the irregular shape of the cyst and the ventricular shift to the left a diagnosis was made of neoplastic cyst extending almost to the surface in the right parietal region and communicating with the body of the right lateral ventricle.

*Operation* was performed under gas, oxygen, and local anæsthesia on Jan. 27, the patient having been undisturbed by ventriculography. A right parietal osteoplastic flap was turned down to expose, after the dural flap had been cut, a softened yellowish area of cortex in the region of the superior parietal lobule. This area was tapped and found to contain xanthochromic clotting fluid at a depth of less than 1 cm. The affected area of cortex was excised, uncapping a large firm greyish tumour surrounding on all sides the cystic cavity, which extended downwards and inwards and opened into the lateral ventricle by a narrow neck about 2 mm. in diameter. When the walls of the cyst were gently separated, clear cerebrospinal fluid welled up into the cavity and, with a little care, the interior of the ventricle could be seen. The tumour was widely excised with the diathermy loop, all hæmorrhage arrested, a small decompression made beneath the temporal muscle, and the flap carefully replaced, all layers being closed with fine black silk sutures.

## LEGENDS TO ILLUSTRATIONS ON PLATE

### MR. HUNTER AND DR. EAST

II—Radiogram showing normal appearance of sternum and small granular calcifications in pericardial sac (case 3).

III—Radiogram showing size of heart before operation (case 3).

IV—Radiogram showing increased size of heart after operation (case 3).

### DR. HOLMES

I—Radiogram of osteomalacia of dorsal spine. Lateral view.

II—Radiogram of osteomalacia of lumbar spine. Lateral view.

### DR. FRANKLIN WOOD

V—Kymogram of a heart with mitral stenosis and aortic regurgitation. The aorta is prominent, but the pulsations are normal in size. There is a double row of pulsations on the right border, of which the upper and outer row represents the enlarged auricle.

X—Kymogram of a heart with aneurysm of the left ventricle. (For description see text.)

MR. HUNTER AND DR. EAST: CHRONIC CONSTRICTIVE PERICARDITIS

Fig. II

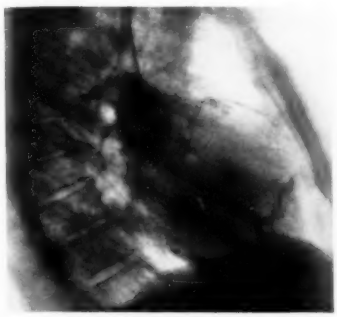


Fig. III

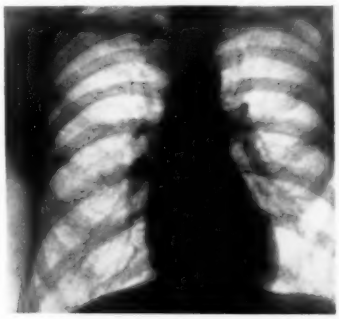


Fig. IV

DR. HOLMES: OSTEOMALACIA OF SPINE ASSOCIATED WITH CHRONIC DIARRHŒA

Fig. I

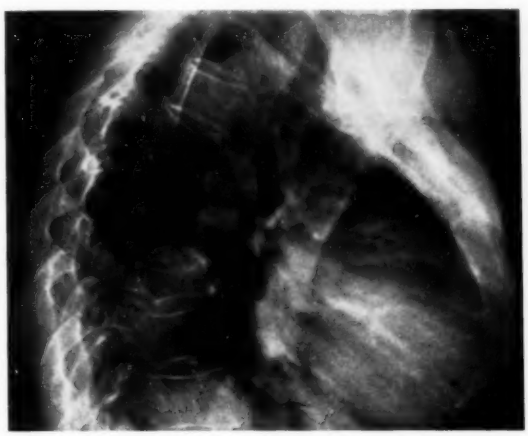


Fig. II

DR. FRANKLIN WOOD: X-RAY KYMOGRAPHY OF THE HEART

Fig. V

Fig. X

MR. MacGOWAN: OSSIFICATION OF THE VERTEBRAL BODY

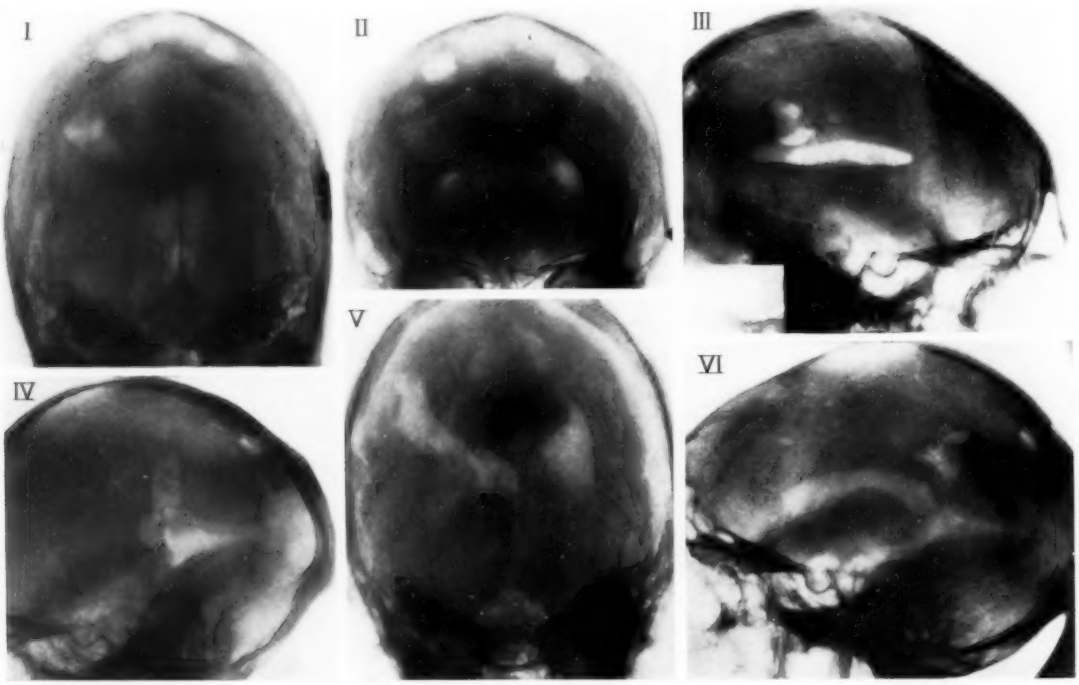
Fig. I

Fig. II

Fig. III

Fig. IV

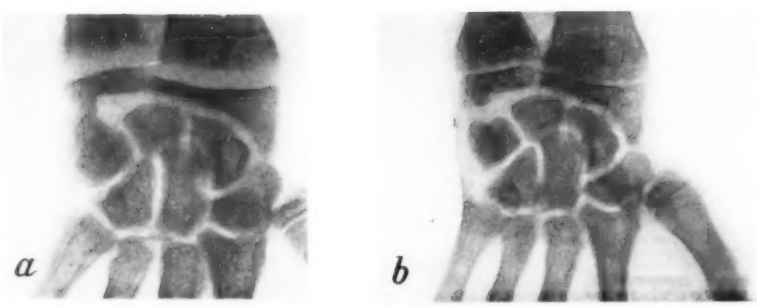
MR. McKISSOCK: NEOPLASTIC CYSTS COMMUNICATING WITH VENTRICULAR SYSTEM




DR. RILEY:

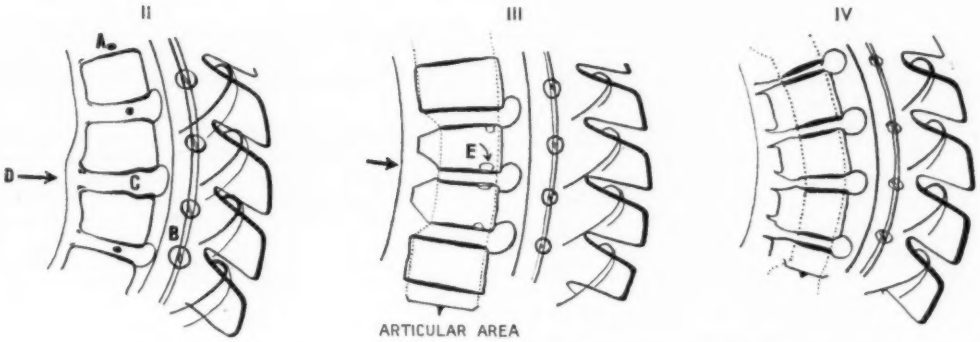
ECZEMA
AND
STEATORRHŒA

Fig. III



## KEY AND LEGENDS TO ILLUSTRATIONS ON PLATE

MR. MACGOWAN



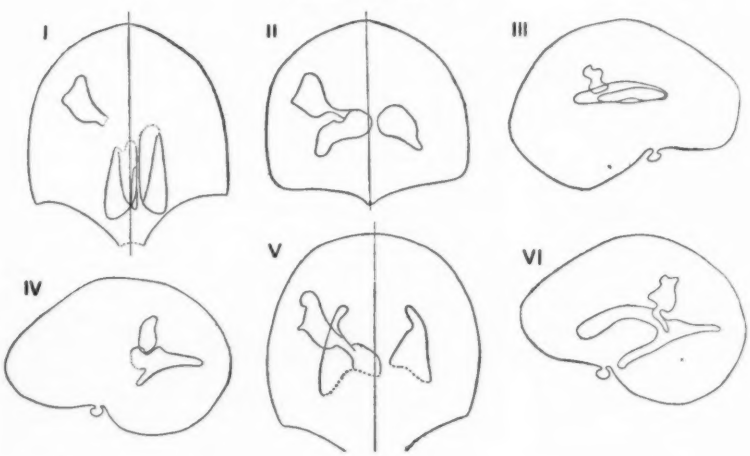

I—Lateral radiogram of dorsal spine showing cuneiform vertebræ and calcification of nuclei pulposi due to injury.

II—Lateral radiogram of spine of boy, aged 13, with early rigid kyphosis, showing irritation overgrowth of ring epiphyses. A, nuclear position; B, posterior laminar joints; C, prolapsed nucleus; D, epiphysial overgrowth.

III—Lateral radiogram of dorsal spine of a child, aged 16, with rigid kyphosis, showing cuneiform vertebræ and predominant endochondral bone formation. E, envelope of dense bone round prolapse.

IV—Lateral radiogram of spine of patient, aged 30, with rigid kyphosis, showing cuneiform vertebræ, limited articular areas, and formation of osteophytes.

MR. MCKISSOCK




I—Semi-axial sagittal supine ventriculogram, showing a slight ventricular shift to the left and an abnormal air-filled cavity in the right parietal region.

II—Axial sagittal prone ventriculogram, showing the ventricular shift and a club-shaped air-filled cavity communicating with the ventricle.

III—Lateral sitting ventriculogram.

IV—Lateral prone ventriculogram.

V—Semi-axial sagittal prone ventriculogram, showing communication between cyst and ventricle.

VI—Left lateral ventriculogram.

DR. RILEY

III—Radiogram of wrists in idiopathic steatorrhœa. (*a*) Severe calcium deficiency; (*b*) healing of bone lesions after two months' treatment with vitamin preparations.

*Microscopical examination.*—Sections from various parts of the tumour all appeared to be typical astrocytoma.

*Convalescence* was rapid and uninterrupted, the wound being healed and all sutures removed by the third day. Five days after operation the patient suddenly experienced a tingling sensation in the left hand and left foot, but this sensation did not spread, and no fit occurred. One week after operation no physical signs could be detected in the limbs or trunk other than the thenar wasting of the left hand, and on the seventeenth day the patient was discharged well and symptomless. At the present time the patient is working as before as an electrician, although he has occasional sensory fits confined to the left side. He had one major convulsion a year ago but has had no further trouble of a similar nature.*

### COMMENT

The first point calling for explanation is the finding of yellow fluid by right ventricular tap when the fluid from the left ventricle was normal. At first it was thought that the needle on the right side had been

* Since the original writing of this case-report the patient has been readmitted with attacks of thalamic pain, almost complete left-sided hemiplegia and hemianæsthesia. Further operative treatment was carried out, with the removal of an extensive recurrence of the growth. Convalescence was uneventful and on discharge a month after the operation the patient was free from thalamic pain, though he had still a complete hemihypæsthesia to pain, light touch and thermal sensation and considerable paresis of the left arm. Recovery of function was still progressing at the time of discharge to Mount Vernon Hospital for deep therapy.

introduced into the cystic cavity rather than into the ventricle; but, when the position of the cyst had been established by radiography, this was seen to be impossible. The most reasonable explanation appears to be that the left ventricular tap, with the consequent fall in pressure in the ventricular system, allowed cystic fluid to enter the right lateral ventricle and so to be withdrawn by the later right ventricular tap. Whatever the cause, no doubt of the communication could exist after radiography.

This case differs in two respects from those reported by Cohen (1936): first, by the absence of internal hydrocephalus and, secondly, by the presence of ventricular shift, thus conforming closely to Lysholm's reported case (1937).

Cohen explains the production of internal hydrocephalus by repeated hæmorrhages into the ventricular system, which undoubtedly happened in his cases, causing partial or complete obstruction of the foramina of Munro or of the aqueduct of Sylvius, on one or more occasions. In this particular case, in which there was no internal hydrocephalus, probably only one hæmorrhage into the ventricular system took place and that one at the time when the communication between cyst and ventricle was established. The history strongly suggests that this communication opened four years previously at the period of unconsciousness lasting for sixty-one hours. Since the history does not suggest any subsequent intraventricular hæmorrhage, the absence of internal hydrocephalus in this patient rather tends to confirm Cohen's view than to refute it.

The ventricular shift in this case, and in Lysholm's (1937), was undoubtedly due to the comparatively large size, slow growth, and firm consistence of the tumour, gradually producing an alteration in the position of the cranial contents, which could not be countered by the leakage of fluid from the relatively small cystic cavity into the ventricular system.

SUMMARY

(1) A case of astrocytomatous cyst of the right parietal region communicating with the right lateral ventricle is described. (2) The condition was demonstrated, before operation, by Lysholm's ventriculographic technique. (3) The absence of internal hydrocephalus is noted and a reasonable explanation given, compatible with Cohen's theory. (4) The presence of ventricular shift is established and explained.

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"... The most outstanding cause of public antagonism is the collective organization of the profession. Organization of medical men is essential for their own and the public's welfare; but such organization is seriously resented because of suspicion that public interests are thereby subordinated to professional advantage. The public insists that the doctor should retain his personality at all costs. Anything that tends to make his relations with his patient impersonal is rightly held to be detrimental. It is precisely this aspect of organisation that is resented."—Editorial. *Med. J. Aust.* Dec. 3, 1938, p. 954.

# METABOLIC ECZEMA IN IDIOPATHIC STEATORRHŒA

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(WITH ILLUSTRATIONS ON PLATE)

Eczema in association with cœliac disease and related deficiency disorders is recognised by the dermatologist. The characters are those of a dry scaling or sticky patchy eczema, often confined to the exposed parts but sometimes very extensive. Itching is not a feature as in most eczemas, and the complete lack of response to rest, soothing applications, and X-ray therapy may draw attention to the diagnosis. Thaysen (1935), Bennett, Hunter and Vaughan (1932), and Moore (1936) describe cases.

CASE-RECORD

A boy of 17 limped with great difficulty into the outpatient department in January, 1938, and gave the following history. At the age of 15 he developed eczema of his legs and rheumatic pains in his knees and ankles. At 16½, four months before he attended out-patients, the eczema became generalised and the "rheumatism" much worse. No history of polyuria was obtained, but there had been thirst recently. There was, however, no complaint of renal pain. No history of diarrhœa could be obtained at any time. His parents are healthy, and his sister, aged 14, is healthy and taller than he is. Before this illness he had always been a healthy normal boy. His mother said that he sat up early and walked and talked at 10 months. He was above the average mentally and sat for a scholarship at school but was unsuccessful. He was a poultry-farmer, because of his poor physique, and kept the accounts of his farm without assistance. His only severe illness was "pneumonia" at the age of 7.

He was a cheerful intelligent youth, able to walk with the aid of two sticks (fig. I). His trunk and large areas on his legs were covered with a sticky scaling eczema, which also involved the face and hair margins (fig. II). The feet, hands, and scalp were clear, but the hair was short, wiry, and scanty. In contrast with some other recorded cases, and also with pellagra, there was no restriction of the lesions to exposed sites and no pigmentation. The nails were somewhat dystrophic and pitted as in psoriasis. The mouth, tongue, and eyes were examined, since lesions occur there in various deficiency diseases, but they were normal, apart from numerous decayed teeth.

The gait, which had first attracted attention, was painful and waddling, with projection of the hips; and without sticks the patient could not walk at all. Further examination of the skeletal system revealed prominent genu valgum with enlargement of the knees, wrists, and ankles. Below the knee these swellings were somewhat masked by a slight non-pitting œdema of the soft tissues. There was no beading of the ribs, but the skull was of an unusual shape, being proportionately broader at the vertex than at the base and lengthened anteroposteriorly. There was a noticeable lack of physical development, as shown by his being only 4 ft. 11¾ in. tall, instead of 5 ft. 6 in., the average height for a boy of his age. Sexual development, however, was normal.

No evidence of renal rickets was obtained. The blood-pressure was 95/70, cardiac hypertrophy was absent, the fundus oculi was normal, and the urine showed no casts or albumin or alteration of the specific gravity, although repeated observations were made on this point. To the naked eye the stools appeared normal. There was never any pyrexia.

*Laboratory tests.*—The Wassermann reaction was negative. The results of further tests are set out in the accompanying table.

RESULTS OF TESTS

| Test | Date in 1938 | Result | Normal |
|---|---|---|---|
| Blood-urea nitrogen | Jan. 14 | 16·3 mg. per 100 c.cm. blood | 10–25 |
| | Mar. 9 | 15·2 | |
| Blood calcium | Jan. 8 | 7·8 mg. per 100 c.cm. serum | 9–11 |
| | „ 27 | 8·4 | |
| | Mar. 8 | 9·1 | |
| Blood phosphorus | Jan. 8 | 1·3 Ditto | 3–5 |
| | „ 27 | 1·6 | |
| | Mar. 7 | 3·0 | |
| Blood phosphatase* | Jan. 8 | 7·2 units | Less than 10 |
| Urea-clearance test | „ 26 | 38% clearance | More than 70% |
| | Mar. 10 | 79% „ | |
| Fæces .. | Feb. 22 | Total fat .. .. 36·03% | Less than 25% |
| | | DRY FÆCES | |
| | | Free fatty acid as soap .. 22·93% | Less than 20% |
| | | Free fatty acid 8·66% | |
| | | Neutral fat .. 4·44% | Less than 11% |
| | Mar. 11 | Total fat .. .. 38·41% | .. |
| | | Fatty acid as soap 23·75% | .. |
| | | Free fatty acid .. 11·34% | .. |
| | | Neutral fat .. 3·72% | .. |

* Jenner and Kay's method.

Careful measurement of intake and excretion over a period confirms the very low absorption of fat. A blood count on Jan. 19, 1938, showed:—

| | | | |
|---|---|---|---|
| Red cells .. | .. 4,300,000 | Polymorphs .. | .. 75% |
| White cells .. | 6300 | Lymphocytes .. | .. 17% |
| Hæmoglobin .. | 63% | Monocytes .. | .. 2% |
| Colour-index .. | 0·7 | Basophils .. | .. 5% |
| | | Eosinophils .. | .. 1% |

On March 9 the count was as follows:—

| | |
|---|---|
| Red cells .. .. .. .. .. | 3,700,000 |
| White cells .. .. .. .. .. | 8400 |
| Hæmoglobin .. .. .. .. .. | 64% |
| Colour-index .. .. .. .. .. | 0·86 |

A Rehfuss test was done on March 14, and the findings were normal. There was no evidence of creatorrhœa. The renal output was low, varying from 20 to 40 oz. a day.

Radiography showed no fractures, but there was evidence of severe calcium deficiency in all the bones. Wrists (fig. IIIa on plate), ankles, and knees showed broadening of the diaphysial ends and widening of the space between diaphysis and epiphyses. The ends of the bones were, however, better defined than in infantile rickets. Lines of delayed ossification were seen near the diaphysis. The heads of the femora showed "slipping."

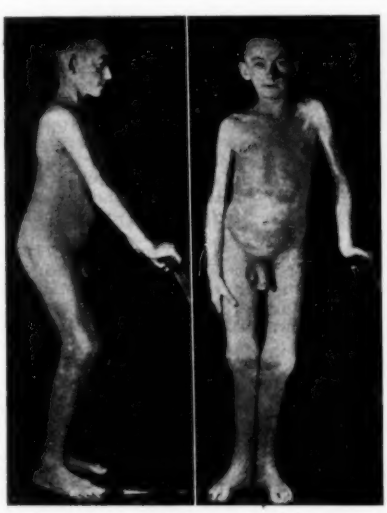

FIG. I—Deformity in idiopathic steatorrhœa; anterior and lateral aspects.

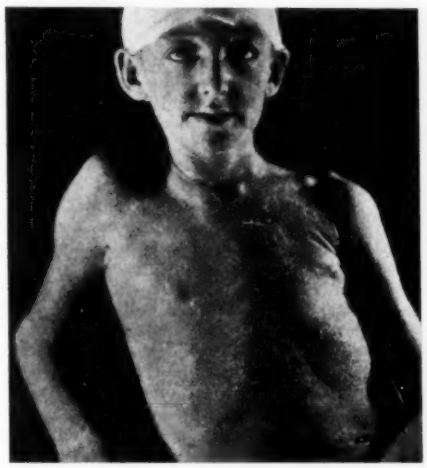

FIG. II—Metabolic eczema in idiopathic steatorrhœa.

Further radiograms after two months' treatment with vitamin preparations showed bony healing (fig. IIIb), and the skin improved greatly, although it was far from cured, since large circumscribed erythematous areas remained, which tended to scale immediately if left without their local cod-liver oil dressing. No renal calculus was seen on radiography.

### COMMENT ON LABORATORY FINDINGS

The improvement in renal function as shown by the urea-clearance test is remarkable. The important laboratory finding, however, is the excess of unabsorbed split fat in the stools. With the diagnosis resting between renal rickets and idiopathic steatorrhœa, the apparent severe impairment of renal function was much in favour of the former, but the normal blood-urea and other renal findings cast doubt on this diagnosis. The improvement in renal function might have followed the improvement in the general condition (Badenoch and Morris 1936). It has been pointed out that impairment of renal function is often associated with disorders of calcium metabolism (Price and Davie 1937, Fowweather and Pyrah 1938).

The high unabsorbed split fat is almost conclusive evidence of the condition being due to a defect in absorption from the intestine."

### DISCUSSION

The following points seem relevant to a discussion of the diagnosis of this case.

(1) In idiopathic steatorrhœa some abnormality of the stools is found, but this may be of percentage composition only, and there may be no history of diarrhœa, although diarrhœa is usual. There was no diarrhœa, but there was the typical abnormality of the stools in the case reported.

(2) Deformity often develops at an early stage in idiopathic steatorrhœa. When renal rickets is diagnosed, renal function is usually much impaired. In the case reported here the only previous illness was pneumonia. Inquiries about micturition revealed an oliguria rather than a polyuria, which was confirmed

by measurement. Recent slight thirst had been present. No history of any bowel disorder could be obtained.

(3) The records of cases of renal rickets (Cockayne and Lander 1932, Ellis 1933, Hunt 1927, Langmead and Orr 1933, Orr et al. 1924, Ford 1933, Price and Davie 1937, Schoenthal and Burpee 1930, Mitchell 1930, and Smyth and Goldman 1934) make no mention of any skin changes other than dryness and pigmentation. They include Hunt's review of 54 cases and Mitchell's review of 200 cases. In idiopathic steatorrhœa, on the other hand, skin lesions are common. In one of the cases of Bennett, Hunter and Vaughan (1932) the skin lesion was the presenting symptom. Levy Simpson (1935) also cites a similar case. Such lesions appear, however, to be pellagrinous—i.e., to be confined to the exposed parts, to be associated with pigmentation, and to be sharply demarcated, none of which features was present in the case reported here. The hair in both conditions tends to be sparse.

(4) Tetany is commoner in cœliac disease. It is said to be prevented by the acidosis of renal disease (Schoenthal and Burpee 1930). It was absent in this case.

(5) Mental retardation is common in children in both renal and cœliac cases but is not described in adults in steatorrhœa. In cœliac disease the child is often highly unpleasant in the active phase (Parsons 1932). My patient was intelligent and agreeable.

(6) Abdominal distension, which was absent here, is not common in adults with either disease but, if it occurs, favours the diagnosis of idiopathic steatorrhœa.

(7) Renal pain was absent. The low blood-pressure is common in steatorrhœa in the acute phase. The absence of hypertension and the normal condition of the optic fundus in the present case were opposed to the diagnosis of renal rickets, as was the absence of cardiac hypertrophy, although these are much less constant features in renal rickets than they are in renal disease uncomplicated by rickets.

Œdema of the nephritic type—a pitting œdema of a gravitational type often associated with œdema of the face—occurs in renal rickets. The œdema in this case was a non-pitting œdema, localised to the legs, and not gravitational (i.e., not involving the feet); it suggested rather a nutritional defect from interference with the water metabolism of the tissues in that area.

(8) The urinary changes could not have been those of renal rickets, in which there is always a polyuria with a urine of low specific gravity, although casts and albumin are not common.

(9) The low phosphorus and phosphatase, again, are evidence against renal rickets but are in keeping with idiopathic steatorrhœa.

(10) Hypochromic anæmia may be found in cœliac disease, but in adults a hyperchromic anæmia is commoner.

(11) The response to treatment is in favour of a cœliac type of disorder.

### CONCLUSION

There can be little doubt that the findings in this case depended on defective absorption from the bowel. It would seem that the whole metabolic disturbance, including the dermatosis, depended on vitamin deficiency associated with lack of phosphorus and calcium. Minor degrees of metabolic disturbance of this type, with accompanying deficiencies, may probably play a part in some cases of intractable eczema.

My thanks are due to Dr. J. T. Ingram and Dr. W. MacAdam for permission to publish this case, to Dr. F. S. Fowweather for the biochemical determinations, and to all of them for much help and advice.

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## OSTEOMALACIA OF THE SPINE ASSOCIATED WITH CHRONIC DIARRHŒA

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(WITH ILLUSTRATIONS ON PLATE)

A case of osteomalacia of the spine recorded recently in these columns by Meulengracht (1938) prompts me to record the following case, in which a very similar decalcification of the vertebral column was associated with recurrent attacks of diarrhœa, the cause of which remains obscure.

### CASE-RECORD

A woman, aged 60, seen for the first time in October, 1937, complained of severe pain in the back and frequent attacks of abdominal discomfort with diarrhœa. She is the wife of a retired colonial official and had lived in Burma from 1919 to 1926 and in Rhodesia from 1926 to 1928, since when she has lived in this country. She is childless.

In 1920, when in Burma, she had the first attack of the intestinal disorder which still persists. It consists of a severe colicky discomfort, sometimes amounting to actual pain, associated with diarrhœa. It was thought to be sprue at the time of onset, but this diagnosis was later abandoned, and the appendix was removed, but no improvement took place. The diarrhœa persisted at intervals until 1925, when she began to take Dimol, which, she says, gave her some relief. During her stay in Rhodesia and for some time after her return to England she was comparatively free from diarrhœa.

Pain in the back began in the summer of 1933, when she had two attacks of severe lumbago. In 1934 the intestinal upset began again, and the diarrhœa recurred at intervals of four to five days. She also had two more attacks of lumbago in the winter of 1934. In 1935 an attempt was made to remove a septic tooth stump under a general anæsthetic, and immediately after this the diarrhœa became so severe and persistent that she was sent to a London teaching hospital for a biochemical and radiological investigation of her alimentary tract, but this gave no significant information. In 1936 the tooth stump was successfully removed, but soon afterwards she strained her back in trying to open a gate, and the pain became very severe, persisting for several weeks. In 1937 the pain became almost continuous, and she was treated without success in the

physical medicine department of a London teaching hospital. In the summer of 1937 she visited a spa and had more physical treatment. Here the gall-bladder was radiographed, and, although no abnormality was found, she was told to take a "fat-free" diet. The diarrhœa and pain in the back persisted until October, 1937, when I saw her for the first time.

*Examination.*—Her nutrition was good. There was a slight dorsal kyphosis but no limitation of movement of the spine, although movement was painful, and the constant pain was accentuated by it.

Neurological examination revealed no sensory or motor changes, but all the tendon-jerks were very brisk, and Chvostek's sign was present on both sides. At this point I elicited the history that some weeks previously she had had a typical attack of tetany, with carpo-pedal spasm lasting a few minutes. This followed the taking of two tablespoonfuls of "McLean's powder" for some slight "indigestion." She had had no symptoms of tetany before this, and none have occurred since.

The chest and cardiovascular systems were normal, blood-pressure being 155/90. Examination of the abdomen revealed no tenderness or visceral enlargement. There was no swelling in the thyroid region.

*Radiological investigation.*—The vertebral column shows extreme decalcification, with some dorsal kyphosis and a slight scoliosis to the left. Most of the vertebral bodies show collapse and "hour-glass deformity," particularly in the dorsal region. There is some slight osteophytic lipping in a few of the vertebræ (see Plate). The pelvis and long bones also show calcium deficiency, but not to the same extent as the spine. There is no pelvic deformity. The calcium deficiency was very evident in a radiogram of the patient's forearm. A barium meal and follow-through radioscopy of the alimentary tract revealed no abnormality.

*Laboratory investigations.*—Serum calcium (estimated on two occasions) was 10·2 mg. and 10·25 mg. per 100 c.cm., and plasma inorganic phosphorus 3·95 mg. per 100 c.cm. A blood-count gave the following figures:—

| | | | |
|---|---|---|---|
| Red cells .. | .. 5,410,000 | Polymorphs .. | .. 56% |
| White cells .. | 4,300 | Lymphocytes | .. 40% |
| Hæmoglobin .. | 90% | Monocytes .. | .. 3% |
| Colour-index .. | 0·8 | Eosinophils .. | .. 1% |

No abnormal cells seen in film.
Reticulocytes, 0·2%.
Wintrobe's volume-index 1·0.
Icterus-index 5 units.

The urine showed no abnormality on repeated examination. A fractional test-meal showed a normal secretion of free hydrochloric acid, and the total acidity was within normal limits. The emptying-time of the stomach was 1¼ hours.

*Fæces.*—Microscopical examination showed no abnormality. No protozoa were seen, and culture showed only *B. coli* after twenty-four hours' incubation. A quantitative analysis of the fæcal fat-content gave the following result:

| | | | |
|---|---|---|---|
| Total fat .. | .. 19·4% | Free fatty acid | .. 4·0% |
| Unsoaped fat | .. 6·0% | Combined fatty acid | 13·4% |
| Neutral fat .. | .. 2·0% | | |

These figures are within normal limits.

The Wassermann reaction was negative. Agglutination tests on the serum were negative to the following organisms:

| | |
|---|---|
| *B. typhosus*, H and O types. | *B. aertrycke*, H and O types. |
| *B. paratyphosus*, A, B, and C. | *B. Newport.* |
| *Brucella abortus.* | *B. enteritidis* (Gaertner). |
| *B. dysenteriæ* (types Shiga, Sonne, and Flexner V, W, X, Y, and Z). | Composite *Salmonella.* |
| | *B. suipestifer.* |

Until her visit to the spa in 1937 the patient had eaten a normal diet, except that she did not take much meat. She had been restricting the fats in her diet for about three months when I first saw her. She very seldom took alcohol in any form and never used purgatives. The only drug she had taken regularly was dimol, which, she was convinced, had lessened the severity of the diarrhœa.

*Treatment and progress.*—When the investigations were complete, she was given a daily dose of calcium sodium lactate gr. 60 by mouth and vitamin D, in the form of Ostelin tablets, three per day. She was also given daily intramuscular injections of calcium gluconate for the first ten days. She was kept in bed for the first fortnight of treatment. The reflex irritability and Chvostek's sign persisted for about three weeks, during the last few days of which ammonium chloride gr. 45 was given daily

After three weeks the pain in the back had completely disappeared, and the diarrhœa had not recurred. The patient could walk considerable distances without pain and move her back freely. I saw her again in February, 1938, when she was still free from pain and diarrhœa, but further radiograms of the spine showed no significant increase in calcification. More films were taken in May, 1938, and a very slight increase in density of the vertebral bodies was then visible. All the films were taken with the same apparatus and at the same standard exposure. I have not seen her since, but she wrote in October, 1938, that there had been a slight recurrence of the diarrhœa, and there had been some slight pain in the back since she had stopped taking the calcium and vitamin D, but the symptoms had improved immediately she had started taking her medicine again.

In December, 1938, she was seen by Dr. Donald Hunter, and he has very kindly allowed me to use the figures he obtained in his biochemical investigations, which were as follows:—

Serum calcium 10·8 mg. per 100 c.cm.
Plasma phosphorus 4·1 mg. per 100 c.cm.
Plasma phosphatase 6·3 units per 100 units.
Calcium balance, per three-day period:—

| Date | Intake | Ca in urine | Ca in fæces | Total calcium excreted |
|---|---|---|---|---|
| Dec. 16–19 .. | 0·306 g. .. | 0·05 g. .. | 0·30 g. .. | 0·35 g. |
| „ 19–22 .. | 0·306 g. .. | 0·05 g. .. | 0·26 g. .. | 0·31 g. |
| Mean .. .. | 0·306 g. .. | 0·05 g. .. | 0·28 g. .. | 0·33 g. |

## COMMENT

The cause of the chronic diarrhœa remains obscure. It cannot be attributed to the persistent use of purgatives as in Prof. Meulengracht's case. There was no evidence of any pathogenic infection of the intestinal tract, and the fractional test-meal showed a normal secretion of free hydrochloric acid. The history strongly suggests tropical sprue, but this diagnosis is difficult to support if steatorrhœa is considered a finding sine-qua-non in tropical sprue. It must be admitted, however, that although a normal fæcal fat-content was found, it was the result of only one estimation, and it is known that considerable variations occur in sprue, depending largely on the fat intake. The patient was taking an ordinary diet at the time the fat analysis was made, but it is to be regretted that accurate measurements of the fat intake and output were not made also.

It is usually accepted that steatorrhœa is an essential factor in the pathogenesis of sprue and the allied "idiopathic" steatorrhœas; but there is some evidence that steatorrhœa may not be an essential factor in the production of tropical sprue. Castle, Rhoads, Lawson and Payne (1935) suggest that it is a deficiency disease closely related to pernicious anæmia in its ætiology. They suggest that there is a defective reaction between extrinsic and intrinsic factors in both conditions, arguing that the degenerative changes resulting in intestinal impermeability are due to deficiency of extrinsic or intrinsic factors or both. These conclusions have been contested by various continental workers, including Hansen and von Staa (1936) and Mogensen (1937), who maintain that steatorrhœa is an invariable finding in tropical sprue and the "idiopathic" steatorrhœas.

It is impossible to draw any definite conclusions from this one case, but the hypothesis that there is a selective deficiency in absorption of calcium and/or vitamin D analogous to the defective absorption of "principles" in other deficiency diseases, such as the megalocytic anæmias, subacute combined degeneration and pellagra, is attractive. It is probable that the diarrhœa was due to an over-excitability of the neuromuscular mechanism of the colon, for it disappeared, together with the other signs of neuromuscular irritability, after the administration of calcium and vitamin D. The rapid disappearance of the pain after treatment with calcium and vitamin D is not unusual in osteomalacia, but it is difficult to explain why it occurs without any evident increase in calcification of the bones. The radiological changes in the bones might cause difficulty if taken alone, but there is no evidence of multiple myelomatosis, hyperparathyroidism or carcinomatosis, conditions said to be of great importance when considering the radiological diagnosis of osteomalacia (Orton 1936).

SUMMARY

A case of severe osteomalacia chiefly affecting the vertebral column is described. The history and symptoms suggest a diagnosis of sprue, but no steatorrhœa was found, although calcium-balance estimations indicated a defect in intestinal absorption of calcium.

I am much indebted to Dr. Donald Hunter for his help and advice, to Dr. C. M. Rigby for the radiological investigations and to Dr. John Menton for the biochemical estimations and agglutination tests.

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## CHEMOTHERAPY IN PLAGUE INFECTION

BY HARRY SCHÜTZE, M.D. Würzburg

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THE remarkable successes achieved with the new series of chemotherapeutic substances in so many diseases naturally suggested their use in plague. Carman (1938) has reported from East Africa the administration of Prontosil in 6 cases, of which 3 recovered. The previous 9 cases had all been fatal, and he thought that the drug was effective. Vine (1938), in a small epidemic in the Nilgiris, treated 3 patients with prontosil. They all recovered, but he expressed no opinion about the efficacy of the drug.

It seemed desirable that laboratory experiments should be undertaken, and three compounds were chosen to that end—namely, the two May and Baker preparations 2-sulphanilyl-aminopyridine (M. & B. 693) and Soluseptasine, and a diamino-diphenylsulphone glucoside obtained from the Wellcome Physiological Research Laboratories and referred to briefly in this paper as sulphone. The animals chosen were the white rat and the white mouse. These two animals are affected in two different ways by plague infection. To obtain a mortality-rate approaching 100 per cent. in the white rat it is necessary to give very large doses (amounting to many millions) of living plague bacteria. In several earlier experiments I have noted that with subcutaneous injections of 100,000–1,000,000 organisms as many as 40 per cent. of the inoculated rats survive. When the dose is raised above 1,000,000 there will be a mortality-rate of 90–100 per cent. Death, when it occurs, takes place rapidly, usually within the first three or four days. On the other hand, small doses of about 100 organisms kill approximately 100 per cent. of mice. Death takes place more slowly—mainly in the second week after inoculation. It would seem that the white rat presents a considerable resistance to invasion, which is overcome only by a large dose of the toxin contained in the broth culture of the test dose, but that then invasion and death occur rapidly.

The test dose for the animals was injected subcutaneously in the flank and consisted, in the case of the rats, of 0·5 c.cm. of undiluted broth culture of *Bacillus pestis* grown for two days at 37° C. and, in the case of the mice, of 0·5 c.cm. of broth culture grown for two days at 27° C. and diluted with saline to the required bacterial content. The cultures for injection were prepared from a highly virulent strain of *B. pestis* received from Bombay in cold storage and so maintained without subculture.

In the case of sulphone and soluseptasine treatment was begun with a subcutaneous injection of the drug, simultaneous with the test dose but in the opposite flank, followed by administration in the water drunk by the animal. The amount consumed was measured daily, but estimation could only be approximate because fluid is often wasted by the animals shaking their water bulbs. A more accurate administration either subcutaneously or by mouth was not undertaken, because of the undesirability of handling the infected animals. In the earlier experiments M. & B. 693 was given by mouth (in one experiment six hours before infection as well as simultaneously) and, because of its insolubility, not in the drinking-water. Later this drug was given subcutaneously at the time of the test dose and subsequently fed daily to the animals in bread. The subcutaneous injection was in two portions: a saline suspension for rapid absorption and a suspension in olive oil for prolonged absorption.

The experiments with rats extended over fourteen days, and those with mice for three weeks. The results of these experiments are given in the accompanying tables.

TABLE I—RATS INJECTED WITH TEST DOSE OF 19 MILLION ORGANISMS

| Drug | Doses (in mg.) given before or with test dose | Average amount taken in drink | No. of rats | Days after test dose on which deaths took place | Survivors |
|---|---|---|---|---|---|
| M. & B 693 | By mouth, 200 six hours before; By mouth, 300 simultaneously | Nil | 6 | 13 | 5 |
| Sulphone | Subcut., 300 simultaneously | 120 mg. daily | 6 | 3, 4, 4, 4, 4, 9 | 0 |
| Soluseptasine | Subcut., 200 simultaneously | 420 mg. daily | 6 | 3, 3 | 4 |
| Controls | Nil | Nil | 6 | 3, 4, 4, 4, 4, 4 | 0 |

A distinct influence of M. & B. 693 on the course of plague infection in rats is clearly demonstrated in table I. The sulphone compound saved none of the animals. Since they all showed toxic symptoms, it had obviously been given in too high dosage. (In a later experiment, recorded in table IV, the effect of smaller

doses was studied.) Soluseptasine exerted a distinct and favourable effect upon the course of the disease.

TABLE II—RATS INJECTED WITH TEST DOSE OF 27 MILLION ORGANISMS

| Drug | Doses given by mouth simultaneously with test dose | No. of rats | Days after test dose on which deaths took place | Survivors |
|---|---|---|---|---|
| M. & B. 693 | 300 mg. | 6 | 3, 4, 5, 10 | 2 |
| | 100 mg. | 6 | 4, 5, 5, 5, 6 | 1 |
| Controls .. | Nil | 6 | 3, 3, 4, 4, 4, 4 | 0 |

A further experiment, recorded in table II, was undertaken to establish whether M. & B. 693 was effective when given in one dose simultaneously with the test dose. This experiment shows that a single dose did not influence much the course of the disease. Table III records an experiment with mice and shows that two doses of M. & B. 693 given before and simultaneously with the test dose did not prevent death in most of the treated animals. (In a later experiment, recorded in table IV, the effect of prolonging treatment by continued daily feeding with the drug is shown.) Sulphone, on the other hand, proved effective therapeutically, 4 out of the 6 mice surviving. Soluseptasine, having been given in too small a dosage, was without any effect. As shown in table IV, the test was repeated, doses five to eight times greater being used. In this experiment with the administration of M. & B. 693 prolonged beyond the initial subcutaneous dose (by feeding the drug to the animals in bread) a very striking influence upon the course of the infection is observed: only 1 of 12 infected rats died and all the 12 mice survived. The dose of sulphone was reduced for the rats but, though probably below toxic limits, did not protect. It was slightly raised for the mice and again achieved a fair amount of protection, only 4 out of the 12 infected mice dying of plague. This contrast between the behaviour of the drug in rats and that in mice is possibly due to the relative ineffectiveness of sulphone when administered subcutaneously, a characteristic which would have a more detrimental effect in the case of the heavy infection and acute onset of disease in the rat than in that of the slow invasive infection in the mouse. Soluseptasine was in this experiment given to the mice in greatly increased dosage but did not protect. This failure with the mouse is in contrast with the fair protection achieved in the treatment of the rat, as shown in table I.

TABLE III—MICE INJECTED WITH TEST DOSE OF 114 ORGANISMS

| Drug | Doses given before or with test dose | Average amount taken in drink | No. of mice | Days after test dose on which deaths took place | Survivors |
|---|---|---|---|---|---|
| M. & B. 693 | By mouth, 40 mg. before; By mouth, 60 mg. with | Nil | 6 | 10, 11, 12, 14 | 2 |
| Sulphone | Subcut., 100 mg. with | 28 mg. daily | 6 | 10, 14 | 4 |
| Soluseptasine | Subcut., 20 mg. with | 10 mg. daily | 6 | 4, 6, 9, 9, 9, 10 | 0 |
| Controls | Nil | Nil | 6 | 4, 8, 8, 9, 9, 16 | 0 |

TABLE IV—FURTHER EXPERIMENTS WITH RATS AND MICE

| Animal | Drug | Doses given subcut. with test dose | Average amount taken in food or drink | No. of animals | Days after test dose on which deaths took place | Survivors |
|---|---|---|---|---|---|---|
| Rats* | M. & B. 693 | 100 mg. in saline; 300 mg. in oil | 300 mg. daily | 12 | 7 | 11 |
| | Sulphone | 300 mg. | 50 mg. daily | 12 | 3, 3, 4, 4, 4, 5, 5, 5, 5, 6, 6, 14 | 0 |
| | Controls | Nil | Nil | 12 | 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 5 | 1 |
| Mice† | M. & B. 693 | 20 mg. in saline; 60 mg. in oil | 60 mg. daily | 12 | | 12 |
| | Sulphone | 100 mg. | 40 mg. daily | 12 | 6, 6, 12, 17 | 8 |
| | Soluseptasine | 100 mg. | 80 mg. daily | 12 | 3, 6, 7, 8, 8, 8, 9, 9, 9, 11 | 2 |
| | Controls | Nil | Nil | 12 | 3, 5, 5, 6, 6, 8, 8, 9, 9, 9, 10 | 1 |

* Test dose 19 million organisms. † Test dose 108 organisms.

A parallel experiment with anti-plague serum was made. One subcutaneous injection of serum was given simultaneously with the test dose but in the opposite flank. The serum had been prepared at the Lister Institute, Elstree, by inoculation into the horse of living smooth avirulent cultures of *B. pestis*, obtained from Dr. L. Otten, who uses them successfully in Java for prophylactic vaccination of human beings (Otten, 1938). The results of this experiment are shown in table V. The test is essentially prophylactic, serum not being administered after infection. In this experiment the larger doses of serum protected 5 out of 6 rats and 5 out of 6 mice, thus giving results comparable with those achieved in rats by M. & B. 693 (see table I, where, however, the drug was given before infection as well as simultaneously). To obtain this degree of protection with the drug, massive doses have been necessary. It rests with future experiments to show whether a combination of the two treatments may not prove superior to either alone.

TABLE V—EXPERIMENTS WITH ANTI-PLAGUE SERUM

| Animal * | Serum dose | No. of animals | Days after test dose on which deaths took place | Survivors |
|---|---|---|---|---|
| Rats* | 0·08 c.cm. | 6 | 4 | 5 |
| | 0·02 c.cm. | 6 | 4, 5, 6, 13 | 2 |
| | Controls | 6 | 3, 3, 4, 4, 4, 4 | 0 |
| Mice† | 0·15 c.cm. | 6 | 15 | 5 |
| | 0·05 c.cm. | 6 | 15, 19 | 4 |
| | 0·02 c.cm. | 6 | 8, 15, 16 | 3 |
| | Controls | 6 | 5, 5, 6, 8, 8, 16 | 0 |

* Test dose 27 million organisms. † Test dose 103 organisms.

## SUMMARY

(1) The efficacy of M. & B. 693, soluseptasine, and a diaminodiphenylsulphone glucoside (called sulphone in this article) against infection with *B. pestis* was tested in rats and mice, the drugs being given both with the food or drink and by subcutaneous injection.

(2) M. & B. 693 proved to be the most efficacious of these three drugs against plague both in rats and in mice, whereas soluseptasine protected rats but not mice, and sulphone protected mice but not rats.

(3) Anti-plague serum injected subcutaneously at

the same time as the test dose of *B. pestis* produced results comparable with those of M. & B. 693.

I wish to express my indebtedness to Dr. G. A. H. Buttle and Dr. L. E. H. Whitby for their advice concerning the doses of the compounds tolerated by the experimental animals and to thank Messrs. May and Baker Ltd. and the Wellcome Physiological Research Laboratories for supplying me with the drugs.

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# CLINICAL AND LABORATORY NOTES

## ANOREXIA NERVOSA

BY J. C. G. EVANS, M.B. Lond.

TWO major references to anorexia nervosa have lately appeared in THE LANCET:—

C. Wallace Ross (1938) describes the favourable response to treatment of a girl of 12, the youngest child of over-solicitous parents, who was to all intents and purposes an only and lonely child among grown-ups (the "misfit"). There is an excellent trigger to be found in the history—namely, the fright caused by her grandmother having a "seizure." During her first stay in hospital, lasting about three weeks, there was no response to treatment and appetite was absent though vitamin $B_1$ was given. She was then taken home unimproved and her condition steadily deteriorated during the 90 days before readmission. A few weeks after readmission investigation of the carbohydrate metabolism showed impaired glucose tolerance which returned towards normal when liver extract was administered, first parenterally and later orally. Hunger was restored only when liver extract was given by mouth, and in Dr. Ross's view this was due to the beneficial effect of the extract on the glucose tolerance. There was no increase in weight until sufficient food (extra malted milk) was given.

In a discussion at the Royal Society of Medicine T. A. Ross (1938) stated that anorexia is a hysterical disappearance from consciousness of hunger and appetite, whilst Hobhouse postulated a block in the afferent autonomic nervous system and suggested that this might be a dissociation or conversion hysteria primarily of psychogenic origin.

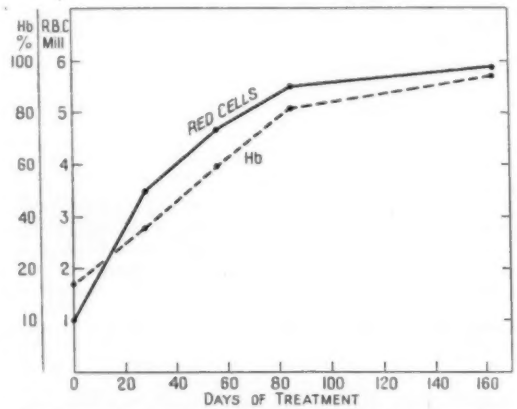
Now hysterical states may manifest themselves by the suppression from consciousness of the afferent, associational or executive side of the nervous system at any level from vegetative to psychological, and it is reasonable to suppose (as Dr. C. W. Ross does) that anorexia may be due to suppression of the affective side of the appetite reflex by psychogenic causes—any physiological abnormalities found being secondary to the inanition. The endocrine imbalance so often accompanying anorexia may be the algebraic expression of (*a*) the inadequacy of the "raw material" supplied to the pituitary (the link between the personality, the central nervous system, the autonomics and the "endocrine orchestra"), and (*b*) a possible depression of the activity of the pituitary, of central origin, secondary to the strained emotional state. No-one can deny that the emotions evoke physiological responses from the autonomic and endocrine systems—e.g., tears, or the cold sweat of fear, with the liberation of adrenaline.

Dr. C. W. Ross regards the stimulation of appetite in his case as a consequence of improved glucose tolerance; but is it not more likely to have been the direct effect of meat extractives—e.g., as in liver extract—increasing gastric secretion? Whichever is true, it is of prime importance to recall that the improvement in appetite only occurred at a moment when the child's change of environment had removed the necessity for continuation of the psychological protest, the result being that the psychological reflex normally following ingestion of meat extractives—i.e., appetite—was allowed to reach consciousness. Had this change in environment not taken place the anorexia would probably have continued.

This argument is well illustrated by the following two cases in which the patient's environment cannot be altered.

CASE 1.—The patient, a woman of 34, showed no response whatever to liver extract. (The menstrual picture was complicated by the presence of fibroids.) In this case the psychological protest still persisted so that the physiological stimulant to gastric secretion did not result in appetite.

CASE 2.—Here the protest has been nearly life-long. The eldest but least intelligent child of a large family, the patient had in childhood maintained her dominance over the family, and her mother's interest, by chronic invalidism and habitual underfeeding. For the past thirty years—she is now in early middle age—she has played upon the feelings of her working-class but not impecunious family, and she has not left her "sick" room for the past twenty years. The habitual underfeeding has led to the development of a nutritional anæmia with a Plummer-Vinson syndrome; in fact the "inability" to swallow has now become a reality. The symptom for which I was called in was nose-bleeding, which was not surprising since her red cells numbered only 1,020,000 per c.mm. and her hæmoglobin was less than 20 per cent. In addition there was gross œdema, auricular fibrillation (the apex-beat being well out in the axilla) and severe cardiac pain. In short, here is an extremely severe anæmia, entirely secondary to a mild but extremely chronic anorexia nervosa.




Response of red-cell count and hæmoglobin to treatment.

The patient was persuaded to take a diet consisting of Allenbury's Beef Juice, as much egg-and-milk as she could be induced to get down, and orange juice daily. The remarkable response of the anæmia to iron in the form of Ferræmia tablets (one tablet three times a day crushed and washed down with water) is shown in the chart. The home influence remains the same, and—as is to be expected on the conception of anorexia nervosa mentioned above—the patient is psychologically unaffected, and continues to "hold court" in her room. Although her weight has increased a little and her blood picture is normal, her appetite has in no way improved.

In these two cases the exhibition of strong stimuli to gastric activity—namely, water-soluble extractives; in liver extract in one case and in beef juice in the other—has had no effect upon the anorexia, despite the fact that in the second case a gross anæmia, secondary to the long-standing anorexia, was completely cured.

I cannot agree with the opinion of Farquharson and Hyland (1938) that anæmia of moderate severity is unusual in anorexia nervosa. I believe that the degree of anæmia is determined by the duration and severity of the anorexia, and in cases where the psychological protest cannot be removed the treatment of the anæmia is only an immediate objective. Surely the fundamental purpose of the treatment of anorexia nervosa is to remove the cause of the psychological protest. The restoration of physiological abnormalities resulting from the anorexia is important but only secondary.

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## BERIBERI COMPLICATING ANOREXIA NERVOSA

By Harold A. Palmer, M.D. Manc., M.R.C.P., D.P.M.

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In a discussion held last week at the Royal Society of Medicine Prof. J. A. Ryle remarked how seldom beriberi is reported as a complication of anorexia nervosa. The following case seems to be an example of this association.

The patient, a single girl aged 22, was admitted to the Woodside Hospital in a very ill state. She was the youngest of six siblings and the family history yielded nothing of interest beyond the fact that a maternal aunt had suffered from a menopausal depression. She had always been unusually timid and shy but she had done well at school and at her training college. About three years before her admission she had begun to be fastidious with her food and had been placed on a diet by her medical attendant on the supposition that she was suffering from a duodenal ulcer. In February, 1937, another practitioner diagnosed her condition as anorexia nervosa. At this time she complained of an extreme dislike of food in any form and a feeling of repletion even after the smallest meal. There was also a history of vomiting. The mother was described as being over-anxious, so that treatment in general was difficult to supervise.

During the whole of 1937 she continued to restrict her food intake, resorting to numerous subterfuges to mislead her relatives; on one occasion she telephoned to them, stating that she was a lady doctor who had just seen the patient, and ordering them to put her on a strict diet! It was not however until the beginning of 1938 that she began to develop mental symptoms or that her physical condition gave rise to major anxiety. She was then placed in a nursing-home for observation. By this time she was confused and restless, and incontinent of urine and fæces; she had a rapid pulse and mild evening pyrexia. She complained of severe tinnitus and at times her behaviour suggested schizophrenia. The one food that she would take was chocolate, of which she consumed quite large quantities.

On admission to the Woodside Hospital on May 3, 1938, the patient was confused and unable to carry on a conversation, but she was able to answer simple questions. As she lay in bed it was observed that she would frequently dorsiflex her head. She was doubly incontinent and was very thin and wasted with a dry scaly skin and a red glazed tongue; for the first two or three days the temperature was 100°–101° F. in the evenings. The pulse-rate was 132 on admission and the respirations varied from 48 per minute on admission to about 25 later on. The optic discs were rather pale, there were nystagmoid movements of both eyes and there was a flaccid paralysis and loss of sensation in both legs. The soles of the feet were tender; no tendon-jerks were obtainable anywhere in the body; and the superficial reflexes of the abdomen and plantars were absent. The base of the right lung was somewhat congested. The cerebrospinal fluid was clear, with 5 lymphocytes per c.mm.; the chemical examination was normal. The blood-count showed 3,500,000 red cells and 8000 white cells per c.mm. The blood-sedimentation rate was 48 (control 2).

The condition was diagnosed as beriberi and the patient from admission was given vitamin $B_1$ (Benerva) in doses of 20,000 international units daily by mouth; after three weeks the dose was reduced to 5000 units a day. At the same time her diet was designed to contain as much butter as possible in order to ensure an adequate intake of vitamin A which, as pointed out by McAlpine,[1] is associated with vitamin B in the deficiency complex. Massage and passive movements to the limbs were also given. She made a slow but steady improvement and is now able to walk unaided; she is normal mentally but still complains of tinnitus, and the tendon reflexes are still absent throughout the body. A recent blood-count showed 4,400,000 red cells.

From a psychiatric standpoint the case is of interest because the patient has given no trouble with her diet since her emergence from the confused condition. The confusion and incontinence cleared up fairly rapidly—i.e., within the first month of treatment.

My thanks are due to Dr. Noel Harris for permission to publish these notes; to Dr. Douglas McAlpine for kindly seeing this case; and to Roche Products Ltd. for a generous supply of benerva.

## UNUSUAL ABNORMALITY OF THE KNEE-JOINT

By E. H. T. Hambly, M.B. Lond., F.R.C.S.

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The following case appears to be an example of a type of developmental abnormality so far unrecorded. Ætiologically the previous history of a kick may be disregarded, for it is difficult to see how an injury could cause the formation of this well-developed abnormality.

The patient was a professional association-football player. He was admitted to the Royal National Orthopædic Hospital on Jan. 9, 1939, complaining of inability to play football properly on account of an acutely tender spot

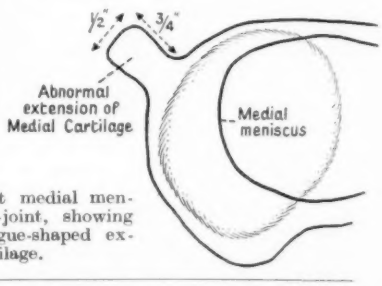


Diagram of right medial meniscus of knee-joint, showing abnormal tongue-shaped extension of cartilage.

1. McAlpine, D., *Middlesex Hosp. J.* 1937, **37**, 143.

on the inner side of his right knee. The history was that four months previously he had been kicked on the inner aspect of that knee. Since that time he had noticed an extremely tender, though localised, spot on the medial side, just below the joint line. There had been no locking, no muscle wasting and no effusion into the joint. His past history was that eighteen months previously an operation had been performed in the same hospital for repair of the external lateral ligament of that knee.

On examination movements of the knee were full, and there was no locking. There was a localised area of tenderness ¾ in. in diameter in the situation described, which was most evident when the knee was flexed and was absent in extension. It was painful only when touched, or when pressure was applied, and in this way prevented him from playing a full game. A small, firm swelling was palpable here, which could be pressed into the joint. X-rays showed no bony abnormality.

On Jan. 10 an exploratory operation on the knee was performed. An oblique incision over the tender spot revealed a tongue-shaped portion of cartilage, which was mobile from within outwards. This was attached to and was a portion of the anterior corner of the medial meniscus (see figure), which was itself normal and, if anything, more firmly attached than usual. The tongue-shaped portion was excised. The specimen removed measured ¾ in. by ½ in. and was ⅛ in. thick and consisted of cartilage.

My thanks are due to Mr. R. Y. Paton for his help and for permission to publish this case.

# MEDICAL SOCIETIES

## ROYAL SOCIETY OF MEDICINE

### SECTION OF EPIDEMIOLOGY AND STATE MEDICINE

AT a meeting of this section held on Jan. 27, with Dr. J. A. H. BRINCKER, the president, in the chair, a paper on epidemiological problems of

#### Poliomyelitis in Schools

was read by Dr. R. E. SMITH. The incidence of acute anterior poliomyelitis had, he said, greatly increased in 1937 and still more in 1938. If this rise was due to the notification of abortive cases, it might be better to discriminate in future on the notification form between the two types of cases. The figures for recent epidemics showed that the problem of poliomyelitis in schools was serious, but the panic which the disease caused in the lay mind was chiefly due to the absence of immunological measures and to medical ignorance of many of the chief facts about the life history of the virus. Experiments on active immunity had been somewhat disastrous for the children on whom they had been performed. The general consensus of opinion was against serum treatment, and the results of work with convalescent serum in prophylaxis had shown a higher incidence of the disease among the treated groups than among the controls. Spraying of the nose with astringent solutions had protected monkeys but not children. Poliomyelitis and polio-encephalitis were now admitted to be the same disease, though their relative incidence varied with different age-groups. The frequent association of pharyngitis with polio-encephalitis suggested that the infection entered by the tonsils and travelled up the nerve tracts to the brain. Astringents applied to the nose would therefore be useless.

When a case broke out at school, the authorities were bound in fairness to tell all parents that no specific treatment existed, that active immunisation was dangerous and usually too late and that the value of passive immunisation and local treatment of the throat was doubtful. They could also, however, be told that localised cases were extremely common and that epidemics were rare. They must be advised on the first appearance of the disease to leave their boys at school, and promised that on the appearance of the second case they would be immediately notified and given a chance to remove them. Parents had not in the past taken sufficient trouble to prevent their children mixing with others. A definite rule should be made that if parents removed their children from school, they should do so in a car and quarantine them for fourteen days from the last contact.

Dr. G. O. BARBER, opening the discussion, spoke particularly of the epidemic which had occurred at Felsted School. While the actual treatment was fairly stereotyped he felt that the procedure of dealing with boys at school, and with parents, the press and the country in general, required a certain amount of thought, and also a standardisation so that the public might know what to expect. He gave details of the epidemic which had, he said, unfortunately occurred at the beginning of the annual silly season and had been very good copy for the press. The school doctor had to spend much of his time emulating the chameleon—swivelling his eyes independently, and turning one on the actual epidemic and the other on the parents who were being perpetually alarmed by the press. He had to be reassuring, but not too reassuring, or he might be blamed later for minimising the danger.

The Ministry of Health had drawn up an excellent code of procedure and had found the balance of advantage to be in favour of not closing the school on the appearance of the disease. So long as the theory of droplet infection from carriers and abortive cases held the field, it should govern medical action. The parent, however, knew that his boy was more liable to infection at school than if he came home, and must have an opportunity of removing him. A boy so removed should be quarantined for the full period. The Felsted authorities had sent different forms of letters to parents of boys in the houses not affected and in the affected house. The first form stated that there was no contact between the infected house and the others and no immediate need for any boy not in the affected house to be sent home, and that the longest-known incubation period was twenty days. The letter set out three possible courses of action: to remove the boy at once, which was not advised; to leave him until the normal breaking-up day; or to leave him in quarantine after that day if he could not be properly quarantined at home. If the boy was taken home, continued the letter, he must be separated from other children and adolescents for the maximum period, and the local medical officer of health must be notified. The letter to parents of boys in the infected house stated that the patients had been isolated and the remainder of the house segregated; and that isolation at home would lessen the danger of infection to a boy but that the school was prepared to keep boys until the full period had elapsed; it gave the rules for quarantine at home.

Schools with a day population as well as boarders had a special problem, and the domestic staff had to

be considered. If the maids were allowed to mix with the people of the adjoining village they might spread the disease; if they were forbidden to do so they would probably give notice and go to their homes. Under modern conditions of community life it was easy to find a common factor between any two persons in the country. Taking account of the infinite number of common factors which had not produced disease, the physician must assume a high degree of immunity in the general population. Nevertheless, a fresh epidemic would appear every summer and show that further immunity had apparently not developed among a large number of people. To suppose that immunity only lasted, in a number of people, from one autumn until the next early summer put another strain on the immunity theory.

An epidemic of influenza was now current in Essex with symptoms which closely resembled those of the first stage of poliomyelitis, and every medical officer who had had an outbreak of poliomyelitis in his school would naturally regard every influenza sufferer as a suspect. Poliomyelitis and cerebral meningitis were by far the most worrying illnesses to the school medical officer, merely because they broke out in a school.

Dr. JOHN LAMBERT said that Wellington College had a boy population of about 670, of whom 450 lived in a central building and the remainder in five separate houses. The epidemic had been confined to the central building: the infection therefore seemed to have spread from the dining-hall. Before the Michaelmas term began, half a dozen cases had occurred in the village and another half-dozen in the country a few miles away. The authorities were therefore on the outlook and had even warned the parents. The local district had been put out of bounds for ten weeks. The first case had appeared in the school in the middle of December. The parents had been warned that two cases had been diagnosed and that all boys would be kept back an extra day if cars were not sent for them. In the next two days all the boys but about 30 had been removed. None of the actual contacts had developed the disease. About 15 cases had been reported afterwards in addition to the original 5, but some of them had obviously been of the abortive type. Only one case had been notified in which a boy had given the disease to another at home. Many boys who were supposed to be in quarantine had undoubtedly gone to Switzerland. The question of how the disease had entered the school had never been solved, but two college servants had been ill, one with a tonsillar inflammation and the other with a feverish cold. The supply of raw vegetables and fruit had been at its minimum at that stage of the term. The epidemic had been spreading at a time when the figures should have been approaching the zero line; poliomyelitis was most rare in mid-winter. Paralysis of the abdominal muscles had necessitated catheterisation in a number of cases. An encouraging reflection for school medical officers was that any action they took would be approved by one body of medical thought and condemned by another.

Dr. R. P. GAMMIE said that in the autumn term Bishop's Stortford College had had an undue prevalence of febrile colds, and one of the patients had developed poliomyelitis in the middle of November. The affected house had been isolated; the day boys' school had been continued but they had been isolated completely from the rest of the school. The preparatory school had been isolated. A maid who had gone to her home the previous Sunday had developed a temperature and not returned. Parents had been notified of the first case, and had received circulars on the outbreak of the second case giving them the opportunity of taking their boys away and urging on them the usual precautions. Only about 10 boys had been left in the school. The lay press had given no attention to the outbreak. A number of parents had said that their doctors had advised them to leave their boys at the school, where they would be attended by medical officers who were more familiar with the disease. The house where the outbreak had occurred was the only house with a refrigerator.

Dr. REGINALD MILLER, speaking from the point of view of a consulting pædiatrician, declared that the most frightened parent was the medical parent, who knew something about the disease and the risks imposed on a boy segregated in a house where several cases might break out and expose him to successive quarantines. A parent paid fifty guineas a term for certain advantages, and exposure to a series of infections of poliomyelitis was not one of them. Dr. Miller agreed with the letters which had been sent out. He complained that the central authorities would not answer the question what harm, if any, had resulted from the disbanding of schools on the appearance of the disease. Poliomyelitis was notifiable, and the available figures must afford a complete reply to this question.

Dr. H. M. RAVEN said that at Broadstairs there had been an epidemic in the town as well as in schools. None of the town cases had been among the poorer classes, and all had been separate cases. He could not believe in the late James Collier's theory that a large swarm of carriers had arrived in Broadstairs from France, but was convinced that the disease was communicated by fruit infected by flies which had risen from the beach after being in contact with the nasal secretions of bathers. High spring tides had driven flies inland in large quantities just before the outbreak.

Dr. MAURICE MITMAN showed tables comparing the relative incidence of poliomyelitis and polio-encephalitis in England and Wales and in London during the last decade; and an analysis of the London figures by age-groups. The ratio was fourteen to one in the youngest children and twenty-five to one in children under five; thereafter it declined to eight to one in young adults. If the portal of entry was the alimentary canal, a much greater degree of control could be applied. It was possible that polio-encephalitis tended rather to follow an inhalation infection and that poliomyelitis tended to be spread by ingestion. If the virus of poliomyelitis travelled through the nose to the brain and spinal cord, it would reach the anterior horn cells on its way, and there was no need then to suppose an infection from the spinal cord.

Dr. F. E. CAMPS thought the assumption that in an abortive case the disease merely took the form of nasopharyngitis went far to explaining how the disease was spread in schools. There was some evidence that paralysis tended to select muscles which had been excessively worked and subjected to nerve exhaustion or trauma. Impulses from those nerves might exhaust the anterior horn cells and create a predilection for those sites.

In reply, Dr. SMITH deprecated too much standardisation of procedure. The influenza epidemic at Bradfield had certainly lowered resistance to the virus of poliomyelitis, and influenza was a factor about which parents would have to be told. It had been the determining factor in cases of septicæmia. On the published results the disbanding of schools imposed only a small risk on the general population.

# REVIEWS AND NOTICES OF BOOKS

## Culture of Organs

By ALEXIS CARREL, M.D. Lyons, Sc.D. Columbia; and CHARLES A. LINDBERGH, A.F.C., D.S.C. London: Hamish Hamilton Medical Books. 1938. Pp. 221. 18s.

THIS work provides a lucid and comprehensive account of the Carrel-Lindbergh perfusion technique for whole organs, and includes a summary of the experimental results so far achieved. The first chapter deals with the purpose and history of the method. It is followed by a fully illustrated description of Colonel Lindbergh's apparatus and of how it is prepared and assembled for use. Different types of perfusing media, with the limitations and advantages of each, the surgical procedure involved in preparing the organs, their installation in the apparatus, and the operation of the apparatus during perfusion are described in great detail. The technique is however so complicated that in spite of Dr. Carrel's assurance that the complexity is only apparent the reader fully endorses his statement that the procedures "cannot be learned merely by reading a description of them. They have to be observed in actual use and practiced under guidance."

The last two chapters on the behaviour of the perfused organs and the future of the method are of more general scientific interest. The results obtained are indeed remarkable. Photographs are reproduced showing histological sections of organs which had been perfused for periods up to thirty days without degenerating. It is possible to modify the physiological activity of the perfused organs at will by altering the humoral and environmental conditions in the apparatus. Thus "under the influence of perfusing fluids of various composition, the thyroid glands are seen to lower their epithelium, to suppress the vacuolation of their colloid and to enter a state of rest. Or, on the contrary, to increase the height of their cells, perforate their colloid with vacuoles, and assume an appearance of great activity. In still other media, the epithelium was observed to become hyperplastic." It is justly claimed by Dr. Carrel that "the cultivation of whole organs has already become capable of very extensive application to anatomical, physiological and pathological problems."

The authors are to be congratulated on a magnificent technical achievement, of which the future possibilities seem almost unlimited.

## Iodine Metabolism and Thyroid Function

By A. W. ELMER, M.D., of the Institute of General and Experimental Pathology, John Casimir University, Lwow, Poland. London: Humphrey Milford, Oxford University Press. 1938. Pp. 605. 30s.

THIS most comprehensive monograph begins with a fifteen-page historical review of the investigation of iodine metabolism from the period of Chatin in 1850 to that of Baumann and Kendall, of Fellenberg and Harington, and finally to the present day. Subsequent chapters deal with every aspect of iodine metabolism and correlated subjects. The various methods of iodine determination in blood, urine, bile and other biological fluids are fully described. The section on physiology includes basal iodine balance, the fate of the various iodine-containing compounds administered to the organism, the relation of the glands of external and internal secretion to iodine metabolism, the production and secretion of thyroid hormone, the influence of the thyroid on iodine storage in such organs and tissues as the pituitary, ovaries, adrenals and nervous system, and the relationship of the vitamins to iodine metabolism. Clinicians will perhaps be most interested in the fourth chapter which deals fully with the pathology of iodine metabolism and discusses the problems of thyrotoxicosis—pre-operative iodine treatment, the nature of the thyrotoxic crisis the iodine balance and the effect of röntgen and radium irradiation—in a clear and critical manner. There is a very generous bibliography containing 900–1000 references.

The author himself has contributed in no small way to the subject of which he writes, and it is a pity so few of his publications appear in journals readily available to English readers. It is almost an impertinence to suggest that such an authority is in error historically, but Dr. Elmer is unorthodox in stating that Marine and Ohleman in 1911 were the first to find iodine efficacious in thyrotoxicosis. The credit for this discovery is usually awarded to Trousseau, who in 1863 gave iodine instead of digitalis to a case of exophthalmic goitre and detected clinical improvement which gradually wore off after the iodine was stopped.

This is the most complete work up to date on iodine metabolism and its clinical application, and can be strongly recommended.

## Queen Charlotte's Textbook of Obstetrics

(5th ed.) By the Members of the Clinical Staff of the Hospital. London: J. and A. Churchill. 1939. Pp. 668. 21s.

A NEW edition of this textbook appears regularly every three years. The present volume differs little from its predecessor except in the section on the treatment of puerperal sepsis: here the new methods of chemotherapy have made revision essential. There is an excellent description of the chemistry, therapeutics and dangers attendant on the use and abuse of the sulphanilamide group of drugs, but one may question the suggestion that the drop in the mortality-rate from puerperal sepsis in the Queen Charlotte's Isolation Hospital from 22·6 per cent. in 1931–35 to 5·5 per cent. in 1936–37 is due to the use of these drugs. It seems more probable that they deserve only a part of the credit. In the section dealing with the operative treatment of puerperal sepsis it is said that the ligation or excision of the ovarian and uterine veins will block the path of the progress of thrombophlebitis. This treatment is surely contrary to all the established tenets of pathology, and its very mention is not worthy of so excellent a textbook. Otherwise there is little that merits adverse criticism.

The chapters dealing with the treatment of hæmorrhage in pregnancy, the toxæmias and delay in labour, are really excellent, and throughout the book a definite and clear line of investigation and treatment is laid down for every abnormality likely to be encountered. The admirable section on the baby has been thoroughly revised and brought up to date by Dr. Alan Moncrieff. The last part, and perhaps one of the most attractive, deals with such subjects as the use of oxytocic drugs and of anæsthetics in midwifery, the value of X rays, and the practical lessons that can be learnt from a short analysis of the causes of maternal and fœtal mortality. The printing and illustrations throughout maintain the high standard of previous editions.

# THE LANCET

*LONDON: SATURDAY, FEBRUARY 4, 1939*


## NURSING AS A NATIONAL SERVICE

THE interim report of the Inter-departmental Committee on Nursing Services, discussed on another page, is no less valuable because it does not present a balanced and comprehensive survey of the problem. The committee makes concrete suggestions designed to stimulate recruitment and to minimise wastage through dissatisfaction with working conditions and prospects, and it disposes effectively of the bogy that measures planned to secure a much larger number of candidates for training could possibly cause the supply of nurses to exceed a rapidly growing demand. A questionnaire has been issued to all hospitals and the analysis of the answers should yield more precise information on the needs of institutions than is at present available; but the committee concludes from evidence already submitted that it is in hospitals that the existing shortage is most acutely felt and most of its present recommendations are concerned with this branch of nursing.

An important exception, which affects the whole profession, is the elaborate discussion of the education of the prospective nurse from the time of leaving an elementary or a secondary school to the stage when she passes the first part (anatomy, physiology and hygiene) of the divided preliminary state examination. The pre-nursing courses hitherto established did not attract many girls because they offered no tangible advantage in the way of progress towards the goal of state-registration. Now that the General Nursing Council have agreed to allow part of the first professional examination to be taken before entering hospital the committee contemplates that after a transition period the usual method of entry to the profession will be by way of pre-nursing courses which will take various forms: full-time courses for senior pupils in secondary schools, and longer part-time evening courses for ex-elementary-school girls employed during the day. The establishment of such courses (which should continue the general education of the students as well as providing specialised instruction) by local education authorities throughout the country is regarded as the most effective method of bridging the gap between school and hospital. The estimate that 12,000 probationers a year are required to meet the needs of hospitals recognised as training-schools has convinced the committee that it is at present impossible to obtain enough recruits from secondary schools. The committee is realistic also in its assumption that hospitals will continue to rely largely on student labour; the alteration of the status of the probationer from that of an apprentice to that of a pupil is evidently not contemplated. The committee recognises moreover that almost from the moment of entry to hospital the probationer gives valuable service; it observes that in 1937 the L.C.C., in view of the difficulty of obtaining staff nurses, engaged a number of first-year probationers in excess of establishment in order to release fourth-year probationers for staff-nurse duties.

No change then is suggested in the pattern of the training of nurses, or in the reduction of the number of registers, general and supplementary, kept by the General Nursing Council; the recognition of a second grade of nurses would indeed add another register (or roll) to those now existing. Some disappointment may be felt that more specific proposals are not made for the recommended increase in the salaries of trained nurses pending the appointment of national committees; that the relative merits of different methods of reducing hours of work are not discussed; and that comment on the syllabus and scope of the final state examination is postponed. But all will welcome the fundamental message of the report: that nursing must be recognised as a service of outstanding national importance and that the social and industrial structure of the nation has undergone such radical changes during recent years that a "sense of vocation" can no longer be relied on as the chief stimulus to recruitment. Remuneration during active employment, provision for old age and conditions of service must be so improved as to enable nursing to compete with other careers open to women. Many of these things have been said before in vain, but the recommendation of grants from national funds to meet the heavy cost of some of the proposed changes will, if adopted, succeed in implementing them.

One thing remains to be said. The final report of THE LANCET Commission appeared at a time when the industrial slump had enhanced the attractions of a professional training that costs nothing except in labour and provides pocket money as well as board and lodging from the outset. An influx of candidates in 1931 and 1932 reassured many hospitals and prevented them from putting their houses in order. This interim report appears at a time when the desire of young women to equip themselves for service in case of war has in some places led to an increase of applicants for hospital training. It would be a calamity if an urge which is likely to be only transitory should postpone action which is essential for the protection of hospital services in normal times.

## THE CLINICAL SCIENCE CAMPAIGN

DURING the last twenty years Sir THOMAS LEWIS has made a series of contributions to medicine which are outstanding in their originality, simplicity and precision. Most of them concern the circulation, and they range from his earlier work on disorders of the heart, through his classical investigations of the blood-vessels of the human skin, to his later studies of the Raynaud phenomenon and other vascular disorders of the limbs. They all bear directly on disease. They all depend

very largely on one type of approach, which is to contemplate a sign or symptom, to define it, to find out where possible how to elicit it at will, and then to investigate it in the patient or in a normal subject by varying the conditions under which it is produced. The immediate aim is to discover the physiological mechanism by which the symptom is produced. The ultimate aim is by the synthesis of such discoveries to arrive at a comprehensive picture of the disease process and a rational method of controlling it. In LEWIS's hands this method has yielded astonishingly rich results. It is his modest conviction that the virtue lies in the method. There are some who have thought otherwise, allotting a larger share of the credit to a certain touch of genius in its application. It may in the course of time be possible to decide which view is right; for throughout those twenty years LEWIS has conducted a persistent campaign for the wider use of the experimental method applied directly to clinical problems, and that campaign has achieved considerable success. His public propaganda for it has taken the form of sundry addresses and orations, originally published in the *British Medical Journal*, and now collected in a volume[1] as a history of the campaign and a statement of principle for its present and future disciples.

Two motives run through these papers. The first is an insistence on the need for closer contact between physiology and medicine. Physiology was the child of medicine. In the middle of last century it broke away from the apron strings, and academically free it grew prodigiously. It has now come to look on medicine as a useful but rather muddled old lady. Sir THOMAS LEWIS is at pains to show that medicine abounds in problems—really problems in applied physiology—which will yield to scientific experimental investigation. He begs physiologists to show more interest in them, and to keep those human problems more predominantly in view when they are teaching medical students. The second motive is his desire that, among the medical sciences, hominal experimental medicine may become established as an important member of the team, with its own field, its own tradition and its own body of workers. His belief is that with adequate opportunity it will make rapid progress. So he has fought for its recognition, under the name of Clinical Science, and for the establishment of units and of salaried positions with reasonable economic prospects, which may attract young men to it and enable it to develop. At times there has been opposition, not so much to his case itself as to the form of its presentation. His faith in the potentialities of the experimental method has made him seem to belittle the value of traditional clinical observation and the collection of accurate data from large numbers of cases. Sometimes he uses "clinical science" as equivalent to what we have called "hominal experimental medicine," at other times in a wider sense to include investigative medicine in general and all that physiology, biochemistry, pathology and bacteriology contribute to it; his readers may not always have kept the two senses distinct. But the opposition has not been serious; the campaign is succeeding. Largely with the support of the Medical Research Council opportunities for careers in clinical science have been created, usually distinct from the medical units already established. The latter have the more comprehensive task of pursuing "academic medicine," which comprises the practice and teaching of the art as well as the study of the science of medicine, freed only from the handicap of competitive private practice.

Whether the more rapid advance in knowledge will come from the older units, or from those which follow LEWIS's principles with greater singleness of purpose, only time will show. From both, at present, are drawn the bulk of the full-time workers who, under LEWIS's leadership, have formed the Medical Research Society, and this has now grown sufficiently in size and consequence to be able to take over from him the editorial control of the journal *Clinical Science*. The society's tradition has been wisely founded. Its atmosphere is scientific and critical. Its growing membership has already produced work of value. Its creation has been a notable achievement on Sir THOMAS LEWIS's part, for genius in research is not often joined with the gift of persuading and organising bodies of men. It is now to the Medical Research Society, inspired by the principles which LEWIS has both preached and practised, that the future will look (to use his own words) to keep Clinical Science abreast in the team of allied medical sciences.

1. Research in Medicine, and other addresses. London: H. K. Lewis and Co. Pp. 75. 5*s*.

## AS OTHERS SEE US

EVERY passing day swells the number of refugees, whose only hope lies in entry to the relatively free countries. Sir JOHN HOPE SIMPSON's monumental survey,[1] which appeared last week, shows that the care of the thousands—soon to be millions—of exiles in Europe is now beyond the power of private charity alone; it must be undertaken by governments. But even the most enlightened government can do little against the wishes of its nationals, and there is a passage in HOPE SIMPSON's book which particularly demands notice from the medical profession. "A less obstructionist and exclusive policy on the part of trade unions and professional organisations," he says, is "essential if the refugees are to achieve economic rehabilitation which will allow final integration. The dictum that the right to work cannot be separated from the right of asylum still remains rhetoric even in countries with a liberal tradition."

This grouping of "professional organisations" with trade-unions may be unwelcome to some of us; but to the outsider the difference between one and the other appears small where the purpose of both seems to be to maintain sectional interests.

1. The Refugee Problem. Report of a survey made by Sir John Hope Simpson, K.B.E., C.I.E., for the Royal Institute of International Affairs. London: Humphrey Milford, Oxford University Press. Pp. 637. 25*s*.

The outsider is aware that the interests of the community do not necessarily coincide with those of the sections of which it is composed; for example it is obvious that "every increase in plenty, while raising the general standard, will damage those sectional interests which are vested in scarcity."[2] Can we confidently claim that the interests of the medical profession, regarded as money-earners, never conflict with those of the community? Are we sure that none of these interests are "vested in scarcity"? Such questions are highly relevant to our attitude towards refugees. If we say that there is no work in England for immigrant doctors, are we prepared to aver that the population in every part of the country gets all the medical care it wants, or even all the care it is willing to pay for? Certainly there may not be a very good living to be had in the areas at present poorly served; but our destitute colleagues might nevertheless accept it thankfully if allowed the choice. Turning to the larger opportunities of the Empire, are we willing to tell our government that there is no possibility of helping refugee doctors to work among the native and white populations? In reaching rapid decisions we are apt perhaps to forget that for many of these would-be emigrants our refusal means, literally, death. But even on purely practical grounds is it sensible for the British Commonwealth, with its huge unhealthy masses, to reject the services of men and women who have undergone the long expensive training required in every European country for medicine? To make these doctors do other work, or no work at all, is a grave human waste. It is rightly described as "a disastrous conception that immigrants can only be of value to our country if they bring with them a fortune, or a new technique, or a world-famous name, or if, on the other hand, they will cook our dinners and scrub our floors."[3]

Organisation for the protection of trade or professional advantage is necessary and valuable, but it carries the risk that men coöperating for selfish aims will take pride in the coöperation and forget the selfishness. The campaign in this country to prevent the rescue of our foreign colleagues has made use of good reasons as well as bad; as its leaders say, there is an undoubted possibility that foreigners engaged in a struggle for existence may at first have ethical standards below the best we cherish. The main appeal, however, has been to the pocket and to prejudice, and it runs counter to the tradition that has hitherto made medicine pleasanter than many other occupations. The best thought of our profession has been inspired by two ultranational ideas—the idea of service and the idea of science—and if we become infected by the pandemic of national exclusiveness we lose both. If we regard ourselves primarily as scientists we cannot afford to neglect the generous example of many of the teaching staffs of the universities, who for several years now have been making contributions, or deducting a proportion of their salaries, so as to enable displaced scholars to work among them. If we regard medicine as primarily humane we cannot afford to let race prejudice enter into our minds, for race prejudice and humanity are incompatible. The medical profession was naturally expected by our government to show friendliness to those in need of it; but the friendliness has hitherto been remarkably cautious. Has not the time come to reconsider an "obstructionist policy" that has done us no credit? The constructive movement in which we should have our part was defined by the Archbishop of YORK a few days ago when he said that everything we can do now to meet the desperate needs of the refugees is "preparing the way for a return of civilised life and hopes among men."

# ANNOTATIONS

## THE CIRCULATION IN PREGNANCY

KNOWLEDGE of the physiology of pregnancy—that is to say, the changes in the physiological systems of the mother—tends to lag behind other physiological knowledge, new techniques being applied to it long after they have been in use for other purposes. It is not so long ago that Sir Joseph Barcroft and his colleagues began an attack on the physiology of the fœtus which involved a study of the maternal respiration and circulation during pregnancy. This work was done on animals and quickly yielded much valuable information; but owing to the usual difficulties comparatively little information of the same kind has been obtained from the human subject.

Now however a team of American workers,[4] partly through using up-to-date methods and partly through having some highly coöperative mothers at its disposal, has been able to report some very interesting observations on the maternal circulation. The main conclusion is that the intervillous spaces of the placenta act as an arteriovenous anastomosis. Regular measurements under basal conditions disclose a combination of high pulse-rate, increased pulse-pressure, raised cardiac output and increased oxygen-consumption. Until the last month of pregnancy, the excess of oxygen-consumption is less than can be accounted for by that of the cardiac output, suggesting that some of the latter is being "short-circuited." The diminished diastolic pressure would be compatible with such an explanation, but the findings cannot be said to be more than suggestive. A comparison between the venous pressures in the arm and leg seems much more significant. Normally these are about the same, but in pregnancy that in the femoral greatly exceeds that in the antecubital vein. In all but local obstructive conditions the two pressures rise together. Experiments on pregnant bitches show that venous pressure in the hind legs remains high even when the abdomen is opened and the vena cava relieved of all mechanical pressure. The pressure in the uterine veins is even higher than that in the femoral vein and the blood returned from the uterus has a higher oxygen-content than that of the mixed venous blood in the right auricle.

2. Plant, A., The Population Problem. 1938. Quoted by Buxton (ref. 3).
3. Buxton, D. F., The Economics of the Refugee Problem. London: Focus Publishing Co. Pp. 46. 3*d*.
4. Burwell, C. S., Strayhorn, W. D., Flickinger, D., Corlette, M. B., Bowerman, E. P., and Kennedy, J. A., *Arch. intern. Med.* December, 1938, p. 979.

Taking all these observations together there seems to be an excellent case for regarding a rapid transit of blood through the placenta as the cause of the obstructive circulatory changes in the lower extremities during pregnancy. The return of blood to the heart is said to be facilitated by the opening up of the alternative subcutaneous abdominal route. This can be beautifully demonstrated by infra-red photography, and there is no doubt that the abdominal venous network becomes more and more distinct as pregnancy advances. Gorman and Hirsheimer,[5] however, after a thorough exploration of the infra-red photographic method, express some doubt as to whether the increased visibility of the subcutaneous vessels necessarily means they are carrying more blood. They point out that while the changes are undoubtedly progressive in any one patient, in a group of women the veins of some who are not pregnant may photograph better than those of some who are. The measurement of venous pressures seems to have provided the most significant evidence

## DRUGS IN CORONARY DISEASE

THE commonest cause of coronary obstruction is atheroma; no remedy is yet available which directly affects this condition. Drugs are therefore only useful in the control of symptoms and complications, and as most of those ordinarily used have unfavourable side-effects they should not be given unless really necessary and then with caution. Gold [6] points out that though the value of some of the drugs recommended is proved that of others is doubtful. The nitrites are still the most valuable in the relief or prevention of effort angina, though their action is transient. Glyceryl trinitrate tablets absorbed from the mouth may be effective in small doses (gr. 1/200–1/150) if taken at the onset of the pain. When pain arises on slight provocation tablets may be required very often, and it is stated that fifty or more may safely be taken daily. In such a case, however, it is necessary to exclude a recent myocardial infarct or recurrent multiple small infarcts, for it is then better to avoid pain by absolute rest than by vasodilators. The subject with effort angina is a potential victim of myocardial infarction in which vasodilators may be harmful, and he should be warned against using such drugs repeatedly for any anginal pain of more than a few minutes' duration, especially if it comes on at rest. It has been claimed that the xanthine derivatives, such as Diuretin and Euphyllin, are valuable both in effort angina and myocardial infarction, and they are extensively used for these conditions, but there have been no controlled clinical or experimental observations to justify these claims. This group of drugs may be rationally used, however, as diuretics, and one of them (euphyllin) may abolish Cheyne-Stokes breathing. When cardiac infarction is accompanied by severe pain morphia is required, but the large doses sometimes needed lead to meteorism, depression of the respiratory centre and possibly ectopic rhythms, though the heart condition itself can produce any of these symptoms. Gold suggests that not more than gr. ¼ of morphia should be given at a time, that this should not be repeated oftener than once every half-hour and that a total of more than gr. 1 in twelve hours is rarely wise. He regards codeine gr. ½–1 with or without scopolamine gr. 1/150 as a good substitute for morphia, especially where a mild pain persists for several days. In most cases a continuous mild sedation is helpful and for this the barbiturates—e.g., phenobarbital—are suitable. For cardiac infarction without complications digitalis is not only unnecessary but probably harmful, but with heart-failure, or auricular fibrillation, or flutter with fast ventricular rates it must be given, though in rather smaller than ordinary doses since in the acutely damaged myocardium ectopic rhythms are more readily produced. Quinidine may be called for in ventricular tachycardia but not otherwise. Measures to increase venous return are indicated for shock, and adrenaline for Stokes-Adams attacks. Gold rightly deplores the use of muscle extracts in the treatment of coronary disease, since there is no properly controlled evidence of their value.

5. Gorman, W. A., and Hirsheimer, A., *Surg. Gynec. Obstet.* January, 1939, p. 54.
6. Gold, H., *J. Amer. med. Ass.* Jan. 7, 1939, p. 1.

## DENTAL CARIES

ACCORDING to R. W. Bunting and his co-workers in the Michigan school the most significant causative factor in dental caries is the presence and degree of activity of *Bacillus acidophilus* in the mouth, but the incidence of caries may be increased by the addition of relatively large quantities of sugar to the diet. These findings are hardly supported by the results of a small-scale investigation reported by King and Croll.[1] Using eight institutional children in Sheffield and thirty from the relatively caries-free country districts of the Isle of Lewis they first related the incidence and extent of caries to the *B. acidophilus* content of the saliva. In the town children no association could be detected; in the others a comparatively low count or complete absence of *B. acidophilus* was found in the majority of the caries-free mouths and a high count in half those with active caries. On the other hand two of the caries-free had a fairly large number in the saliva while half the carious had relatively low counts—two, in fact, were completely negative. There is certainly some suggestion of an association between the variables in these figures, but it is obvious that striking exceptions are not infrequent. With the eight Sheffield children the authors next endeavoured to test the effects of the daily addition to the diet of 2 oz. of sweets in the form of toffee for ten weeks, after which the children rebelled and accepted chocolate caramels for a further six weeks. With such a small number of observations the results must be rather indeterminate. Two children showed no change in their number of carious cavities and little change in the number of colonies of *B. acidophilus*. In the other six there was some increase in carious activity, but how much might have been expected with mere lapse of time is unknown; three showed also an increase in *B. acidophilus*; two no material change; while one remained negative throughout. The authors are rightly reluctant to draw definite conclusions from so small an experience, but they are unable to find in it a corroboration of Bunting's views.

On the other hand Schiötz [2] of Oslo presents more evidence in support of the relation between dental caries and nutrition. Of pupils in the Oslo elementary schools only 2 in every 1000 have, he says, faultless teeth. This is a small number, and for the purposes of the inquiry those defined as having excellent or good teeth were added to them and 200 children thus obtained. Dietary histories were obtained from their mothers and Schiötz thought that these showed a more regular use of protective foods and a smaller consumption of sweetstuffs than in the population in general, but no control group is available. More convincing is the evidence that the children with good teeth are largely segregated in a few schools, the

1. King, J. D., and Croll, J. M., *Brit. dent. J.* Jan. 2, 1939, p. 19.
2. Schiötz, E. H., *Ibid*, Jan. 16, 1939, p. 57.

average number being 17·6 per 1000 in five schools against 0·3 per 1000 in four other schools, and 2·7 per 1000 in the remainder. Various measures of social status show that the good teeth come mainly from the economically better-situated families. In addition Schiötz gives some figures from isolated rural districts where the "old-time natural manner of feeding" is maintained. Of 127 children examined, with an average age of nearly eleven years, 17 per cent. were free from caries, and of 2136 permanent teeth (present and extracted) 27 per cent. were attacked (carious and filled and extracted); much better figures than those presented for Oslo. Investigations were also carried out at 23 infant homes comprising 338 children and the resulting figures show that the earlier in life the children come to the home the better are their teeth. With regard to sugar consumption an interesting comparison is made between two homes. The children in Alfredheim have far worse teeth than those at Trysil. The consumption of milk, coarse bread, butter and fruit is about the same at each home; the Alfredheim children eat more vegetables and potatoes; while the Trysil children have about two and a half times as much sugar. At Trysil, however, all the children have cod-liver oil daily in the winter, whereas at Alfredheim they have it only when ordered by the doctor.

## INJURY AND DISEASE

IN an interesting article which appeared in the *Magazine* of the University of Leeds medical society, Dr. G. F. Walker discusses some of the problems of the relationship between injury and disease. He divides the illnesses which may follow injury into eight classes and gives examples of each, drawing upon his personal experience to illustrate his points. He emphasises quite rightly the importance of this matter in forensic medicine. So much attention is now being paid to the subject in the courts that, at least as far as injuries arising out of and in the course of employment are concerned, the workmen's legal advisers assume with apparent authority that any disease appearing subsequent to an injury is part and parcel of that injury, or in legal phraseology "caused, precipitated or aggravated by it." Thus, contrary to the first principle of British justice, an onus of disproof is thrust upon the medical advisers for the employer.

Much research work needs to be done so that definite guidance may be given to the courts about this. A start could be made by defining injury and disease. Accident-insurance companies have endeavoured to describe the peril insured against as a morbid condition due to injury "caused by violent, accidental, external and visible means." Although at first this may have seemed clear enough, succeeding judgments given in the courts have succeeded in so whittling down the previously accepted meanings of these words that almost the whole range of disease can be covered by them. For instance, "violent" means the contrary of "without any violence at all." As an example, an elephant trampling on a fly may be an original example of violence; but now the fly trampling on the elephant would be held to be "not without any violence at all." Similarly, "visible" may now be interpreted as "discernible by a medical man." In contradistinction to "injury," disease may be held to be a morbid condition which arises and runs its course without any history or clinical evidence of injury. This definition, however, is obviously not sufficient in itself and it may be desirable for some scientific body of medicine to supply the deficiency.

After satisfactory definitions have been given it will then be necessary to search for proof of relationship between the two. No doubt there is often some connexion between injury and disease and it is easy to quote cases in which disease appears to have arisen from definite injury. One of the best examples is carcinoma of the tongue arising from repeated trauma by an ill-fitting dental plate. Another example is the "surgical kidney" following prolonged instrumentation for the treatment of a traumatic stricture of the urethra. It is quite otherwise with generalised epilepsy or tumours of the brain; although in the law-courts these conditions are constantly being attributed to injury, scientific proof is wanting in most if not all the cases. Little has been done in the investigation of normal controls although in some directions a beginning has been made. Among 431 cases of glioma Parker and Kernohan [1] found in 13·4 per cent. a history of injury at some previous time in the lives of the patients. In a control group of 431 consecutive victims of various other diseases there was a history of injury in 10·4 per cent. Among 200 presumably normal persons there was a history of injury in 35·5 per cent.; the relative severity of the injury was highest in the normal group. Among 10,452 cases of gunshot wound of the head occurring in the United States armed forces during the late war, Pollock [2] did not find any case of brain tumour; and of the 40 cases of cerebral tumour occurring amongst U.S. veterans and operated on by Loyal Davis [3] not one had been wounded and only two gave a history of head injury.

In fulfilling the "onus of disproof" the medical witness may have little difficulty in showing that the cause of a particular disease was not a particular injury, but it is often difficult to give a direct negative to a statement that disease was precipitated in a person who was already destined to suffer it, or that disease had already started or had been latent and become aggravated by the injury. Only an accurate knowledge of the usual course of the disease, its accelerations and exacerbations, and a detailed history of the condition of the patient from the onset of the disease or the accident, with a full account of any bridging symptoms, will enable the examiner to form a valid opinion.

## BARBITURATES AND LIVER DAMAGE

SOME of the barbiturates are detoxicated by the liver whereas others are excreted straight away by the kidney. The latter are generally those of quick action, such as Evipan and Pentothal, while the former are typically represented by Nembutal. Anæsthetists ordinarily withhold barbiturate premedication from patients with any form of liver derangement and the work of Cameron and de Saram [4] at University College Hospital medical school shows that the need for caution may be present even before the liver can be known to be imperfect. Experimentally rats with acute liver damage proved abnormally susceptible to both nembutal and evipan; this effect quickly passed off when liver regeneration set in. With progressive liver damage the action of nembutal was much enhanced long before serious structural damage appeared in the organ, and it is suggested that impairment in detoxifying function precedes the development of obvious structural change. Some observers it is true have obtained

1. Parker, H. L., Kernohan, J. W., *J. Amer. med. Ass.* 1931, **97**, 535.
2. Pollock, L. J., quoted by Brahdy, L., and Kahn, S., Trauma and Disease, 1937, p. 317.
3. Davis, L., quoted by Brahdy and Kahn, *Ibid.*
4. Cameron, G. R., and de Saram, G. S. W., *J. Path. Bact.* January, 1939, p. 49.

prolonged sleep in chloroformed cats and dogs not only with nembutal but with evipan which is excreted by the kidney; they have accordingly argued that the effect is not attributable to deficient liver detoxication but rather to injury of the central nervous system by chloroform, so that nerve-cells become more susceptible to barbiturates. To what extent the laboratory findings are applicable clinically has not yet been ascertained, but obviously there is need for much circumspection in the use of barbiturates in association with other anæsthetics, especially chloroform.

## STIGMA AND PREJUDICE

THE anthropologist interested in taboos upon names need not go among savages to find his material. At the recent conference of the National Council for Mental Hygiene, when the organisation of outpatient clinics for mental illness was under discussion, almost all the speakers were preoccupied with the name these clinics should go by and insisted that the word "mental" must be dodged at all costs; none of those present, however, went so far as to propose also that they should in future meet as the National Council for Nerve Hygiene, or that the sister bodies should be invited to disguise themselves as the Central Association for Psychological Welfare and the Nervous After-Care Association. It is surely hasty to assume that the dog given a bad name can be saved by a euphemism: often, as in the proverb, his name is nothing but his reputation, and the new name will not for long conceal the old reputation, provided the latter be deserved. This proviso is the root of the matter. In those places where the mental hospital has still a bad name in the community, to call it a "nerve hospital" or "St. Swithun's" will be of only brief avail in making people ready to go to it either as inpatients or outpatients, so long as it has in fact repellant attributes and terrifying associations.

There is unquestionably much ignorant prejudice against mental hospitals, derived from the bad old past, and everything that betokens the break with that past, or emphasises the medical aspect of mental illness, is so much to the good. But there is also what may be called informed prejudice. Disguising the mental hospital or the outpatient department by some new name will not for long conceal from the public the fact that the hospital, even though most modern and most successful in treatment of many of its patients, houses some people who are hopelessly or abhorrently insane, and that at the outpatient clinic patients may be seen who turn out to need mental-hospital care. If the hospital or clinic is a good one, recognition of these facts by the public will not deter them from seeking treatment when they need it; any more than changing the name, as from "asylum" to "mental hospital," or from "mental hospital" to "hospital for nervous disease," will in itself encourage them to do so. A parallel instance is the cancer hospital. No name could be more calculated to frighten away patients than this, one might suppose, if the same weight is to be given to prejudice and old belief as in the case of the "asylum"; but it has not proved necessary to change the name of this hospital; its reputation, based on the work it does, apparently obviates the need for euphemism. Undoubtedly it is preferable to keep the clinic for outpatients, like the inpatient clinic for recoverable cases generally, separate from the mental hospital (even though in rare cases it is practicable, as mentioned earlier in the discussion, to identify them); but this separation should be based not on an avoidance of disagreeable words, but on honest recognition of an actual difference—viz., that the one cares for people whose mental illness takes a form that may be immediately dangerous to themselves or to society, while the other looks after those whose illness is compatible with ordinary life in society. It is false to emphasise, in implied contrast, the success of the treatment in the outpatient clinic, or even the predominance of psychotherapy in it; for this is to give colour to erroneous notions as to the nature and function of the mental hospital. Both hospital and clinic should care for the chronic as well as the recoverable case, and both should use psychological and physical methods of treatment as their patients' needs require. The common sense and common knowledge of the public must be taken into account as much as the universal human tendency to be misled by words.

A new name should not be regarded as poppy and mandragora, or as a transient alternative to be discarded when prejudice or facts again make this expedient. If we are to throw over "mental hospital" and "psychiatric clinic" as "lunatic asylum" was thrown over, we shall before long get into the ignoble company of those who have ineffectually draped the undertaker in mortician's clothing, and elevated the w.c. into the House of Easement. Psychiatrists, it must be admitted, are sometimes a little prone to project upon the public their horror of plain English. The "stigma" of having been in a mental hospital, or even of having been treated for a "nervous breakdown" at an outpatient clinic, has a little to do with the words used—but a great deal more to do with popular belief about the supposedly unreliable, unpredictable or tiresome conduct of such patients, even after recovery. In the long run, all that is wrong or exaggerated in these beliefs will die for lack of evidential support: its death will be hastened, no doubt, by the educational efforts of the National Council of Mental Hygiene to counteract false notions and ignorant fears about mental illness in all its forms.

## ALCOHOL AND THE HUMAN ORGANISM

THE little book[1] published by H.M. Stationery Office on the action of alcohol, of which a third edition has now appeared, was originally prepared by an advisory committee appointed in 1916 by the Central Control Board (Liquor Traffic) to consider the physiological action of alcohol and its effects on health and industrial efficiency. This committee, which was presided over by the late Lord D'Abernon, carefully revised the material in 1920, and their revisions were incorporated in a second edition published in 1924 under the auspices of the Medical Research Council, the Central Control Board having by then been dissolved. The present revision has been carried out by the surviving members of the former committee.

Among other new features it contains a description of the processes for determining the alcohol content of blood and urine and an important section dealing with blood-alcohol tests in relation to road accidents. Last year Hansen of Oslo found that of 3000 people involved in traffic accidents 1126 had a blood-alcohol concentration between 0·15 and 0·2 per cent., figures which confirm the opinion of Strohmayer that the concentration most conducive to accidents is about

1. Alcohol: Its Action on the Human Organism. (3rd ed.) Revised by Sir Henry Dale, Prof. M. Greenwood, Sir Edward Mellanby, Dr. C. S. Myers and Sir Charles Sherrington; with the assistance of Dr. Margaret M. A. Murray, Prof. A. J. Clark, Dr. E. Arnold Carmichael and Dr. H. W. Newman. London: H.M. Stationery Office. 1938. Pp. 176. 1s.

0·18 per cent. Clinical tests for alcoholism showed that two-fifths of Hansen's subjects with a blood-alcohol concentration of 0·1 per cent. and nine-tenths of those with a concentration of 0·2 per cent. were "affected by alcohol," but it appears that driving may be affected by concentrations lower than those needed to affect the behaviour in ordinary clinical tests. Thus Sachsenberg reported that none of the subjects he tested was capable of driving safely with a blood-alcohol concentration exceeding 0·14 per cent. In the United States a similar definite limit (1·5 per mille) has been accepted by a committee of the National Safety Council. There is probably a considerable individual variation in response and habituation to alcohol may raise the alcohol level at which drunkenness appears. By means of an artificial motor-driving apparatus Vernon studied the effects on driving capacity of 20–45 c.cm. of alcohol in whisky taken on a practically empty stomach. Most of the subjects tested drove more quickly and more erratically than in normal circumstances, usually without realising they were doing so, and with alternating periods of fast and slow driving. Some believed they were driving better after alcohol, but in fact they were less accurate. These characteristics were noticeable even after 5 c.cm. of alcohol, equivalent to half a tumbler of mild beer. Other experiments demonstrated slower response of the eyes, hands and feet after alcohol consumption.

Miles in 1924 investigated the effect of alcohol on skilled movements by administering it in two different doses (21–28 grammes and 32–42 grammes) to five professional typists who were moderate beer-drinkers. During the first two hours after taking the weaker and stronger doses, the errors in typing nonsense syllables increased by 24 and 73 per cent. respectively, and the speed decreased by about 3 and 6 per cent. The errors in typing practised sentences increased by 40 and 90 per cent. respectively, and the speed decreased in both cases by about 2 per cent. The incidence of errors was greater when the alcohol was taken on an empty stomach. Another experiment of Miles is also described in this book. Here the subject is required to counteract deviations of a needle in an electrical apparatus, the "pursuit-meter." The movements of the needle, which are comparable to but quicker and more irregular than those of a ship's compass, allow the passage of an electric current which is measured, smaller readings corresponding to greater accuracy of movement of the subject. After drinking a litre of 2·75 per cent. alcohol, equivalent to 1½ pints of very light beer, the current allowed to pass was about 11 per cent. more than when the subject had drunk the same quantity of water; but the figure was raised to over 16 and 22 per cent. in the same subject when the alcohol was diluted with grape-juice or non-alcoholic beer respectively, and in four other subjects the same dilution of alcohol with water gave an average increase of about 19 per cent. From these and other experiments it is concluded that a single dose of less than 40 c.cm. of alcohol, equivalent to 2¾ oz. of whisky at proof or one pint of beer, taken by an adult accustomed to moderate use of alcohol, does not impair movements that do not demand precision, but skilled movement may be temporarily impaired especially in the diminished speed and nicety of the required act's performance by even 30 c.cm. of alcohol. The sedative effect of alcohol may, however, improve skilled movements in a nervous person by decreasing anxiety.

Other additions to the present volume include the work of Penrose who showed from a clinical and genetic study of 1280 cases of mental defect that the children of alcoholic parents were no more likely to be defective than the children of abstainers of similar mental grade; and the revised life-tables of Raymond Pearl which, in the committee's view, confirm the general impression that heavy drinking is prejudicial to life and "the probably equally general impression that *moderate* drinking cannot be shown to be deleterious."

## ANOREXIA NERVOSA

THE effect of mind on body is nowhere more strikingly displayed than in anorexia nervosa, and the present interest in psychosomatic relationships has brought this disease into prominence. The opinions put forward at a meeting of the section of medicine of the Royal Society of Medicine on Jan. 24 formed a useful supplement to those provided by the section of psychiatry early last November.[1] Prof. J. A. Ryle, the opener, said that in his experience of 63 private cases nine patients out of ten are women and girls, and seven out of ten are unmarried and under 30. Most of them may be classed as psycho-neurotic and the prognosis is then very good if the proper conditions of management can be secured. The clinical picture includes the general effects of starvation and he sees no need for treatment with endocrine preparations or (unless the physical condition is grave) by injection of vitamins. Dr. J. H. Sheldon pointed out that the condition resembles not only starvation but also anterior-pituitary insufficiency; indeed on the Continent it is generally diagnosed as Simmonds's disease. The best way of explaining this resemblance is, he thinks, to assume that the features of starvation are not a series of haphazard peripheral effects but are brought about by a coördinated mechanism (possibly hypothalamic) whose main characteristic is a diminution of anterior-pituitary activity. Anorexia nervosa arises in response to an emotional or mental need, and the lowered food-intake sets in motion a series of changes which are "mediated" to the body through a reduction of anterior-pituitary secretions. Dr. A. W. Spence said that in his view the endocrine dysfunction is definitely secondary. It is true that amenorrhœa may develop before there is any loss of appetite, but it can be regarded as an early symptom of disturbance of the higher nervous centres. "After the anorexia has become established," continued Dr. Spence, "I feel that the endocrine features may perhaps be explained in terms of vitamin deficiency. A likely cause of the amenorrhœa, in addition to the psychological disturbance, may be the deficient intake of vitamin E"—lack of which has been shown to cause changes in the anterior pituitary of rats.[2] Deficiency of vitamin A might also play a part, by interfering with the action of whatever gonadotropic hormone is secreted, and by causing keratinisation of the thyroid. The non-appearance of the more severe nutritional disorders in the course of anorexia nervosa—to which rule Dr. Palmer provides an apparent exception on p. 269—was tentatively explained by Dr. Spence on the hypothesis that the endocrine system is for some reason relatively hypersensitive to vitamin deficiency. Hormone treatment he has found disappointing.

In the previous discussion Dr. H. Crichton-Miller tersely described anorexia nervosa as a compromise with suicide, and the emotional aspect of it is well brought out by Dr. Evans in the clinical note we

1. *Proc. R. Soc. Med.* January, 1939, p. 153; see also *Lancet*, 1938, **2**, 1173.
2. Barrie, M. M. O., *Lancet*, 1937, **2**, 251.

publish on another page. At last week's meeting Sir Arthur Hurst said that the patient should always be treated by a general physician and that he should begin by giving her an ordinary meal and sitting beside her while she ate it. Unfortunately, as Dr. Spence remarked, she may afterwards go away and vomit; and in these and other difficult cases the physician may have to give place to the psychologist.

## KARL PEARSON

In writing an account of his father's life a son is at a disadvantage as well as an advantage; he has an intimate contact with the labours and ambitions of his subject, but he cannot easily take an objective and dispassionate view of him. Those who read the reprinted edition [1] of two articles which originally delighted readers of *Biometrika* will find that Prof. E. S. Pearson has not only availed himself fully of the privilege of his position but at the same time has been able to preserve an admirably balanced outlook on his father's work and influence on scientific thought and method. The elder Pearson's career is sympathetically traced from the time that he was called to the bar in 1881 (after which he turned his fertile brain to historical research in studies of German social life and thought) to his appointment in 1884 at the age of twenty-seven as professor of applied mathematics and mechanics at University College, London, and to his later associations with Weldon and Galton and so to the final development of the biometric school with its growing application of statistical methods in research and ever-widening influence in all branches of scientific work. A glance at the bibliography appended is sufficient to display the enormous range of Karl Pearson's interests—from the mathematical theory of evolution to the experimental study of the stresses in masonry dams; from a study of the long bones of the English skeleton to the influence of parental alcoholism on the physique and ability of the offspring; from the light-fluctuation of variable stars to a monumental study of the Wilkinson head of Oliver Cromwell—all linked together by an intense devotion to the search for knowledge. This brief but living account of it all should secure even a wider audience than that of which it is certain—namely, the generations of students who for nearly half a century drew inspiration from the work and personality of "K. P."

## THE WAVE-LENGTH FACTOR IN RADIOTHERAPY

At the request of the Joint Committee on Radiotherapy Crabtree and Gray have inquired [2] further into the influence of wave-length on the biological effectiveness of radiation. The criterion they have chosen for estimating the effect of the radiation is a biochemical process—namely, inhibition of the anaerobic glycolysis of rats' retinas—and may not be universally acceptable. Their experiments on such inhibition, which have been well planned and controlled, have shown no evidence of any dependence of biological effect on the quality of the radiation used. Not the least useful part of the paper lies in the appendix written by Crabtree on the relation between metabolism and radiation effects. The careful reader of this appendix will realise the cleavage of opinion in radiological circles on the essential nature of the changes induced in cell life by radiation. C. M. Scott, it will be remembered, after examining the quantitative aspects of the biological actions of X and $\gamma$ rays came to the conclusion [3] that metabolic processes play no part in the primary action of radiation on cells; whereas such action is considered so significant by the present authors that they use it as the basis of their tests. In combating Scott's views Crabtree deprecates the basing of generalisations on the study of one type of tissue. Perspective is confused by workers whose negative results lead them to deny the existence of differential action. The present authors are content to let their experiments stand as a contribution to fact; for, as they remind us, no evidence can be contrary to facts. The present rigorous methods of physical measurement should permit of a much greater elaboration of effort on the wave-length factor, preferably on tumour-bearing animals, for the main interest lies in its possible application in radiotherapy.

1. Karl Pearson. An appreciation of some aspects of his life and work. By E. S. Pearson, D.Sc., professor of statistics, University College, London. London: Cambridge University Press. 1938. Pp. 170. 10s. 6d.
2. Crabtree, H. G., and Gray, H. L., *Brit. J. Radiol.* January, 1939, p. 39.
3. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1937, No. 223.

## INTRAVENOUS GUM ARABIC

Since Bayliss introduced gum-arabic infusion to replace lost blood, very diverse results have been obtained from its use. Despite Bayliss's directions that only reliable samples of gum should be employed, it seems possible that some of the failures have been due to the use of unsuitable gum. In studying this possibility Maas,[4] working with rabbits, records fatalities with one solution and good results with another. He found that when the calcium of the satisfactory solution was replaced by sodium it became as lethal as the other and that this effect could be neutralised by an injection of calcium chloride. The explanation put forward is that a solution of sodium arabinate will extract calcium from calcium-containing solutions, including blood, and so induce a fatal hypocalcæmia. Maas accordingly recommends the use of pure calcium arabinate, which he has found entirely harmless to rabbits.

4. Maas, J. A., *Quart. J. exp. Physiol.* December, 1938, p. 315.

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We regret to announce the death of Mr. Joseph Lewin Payne, consulting dental surgeon to Guy's Hospital and an authority on the structure of teeth.

In response to an appeal from the Chilean Red Cross the British Red Cross Society has sent £500 for relief work after the earthquake in Chile which is said to have caused the death of 30,000 people and injury to 50,000 others.

At the Mansion House banquet on Jan. 30 more than £60,000 was subscribed towards the £650,000 required to complete the rebuilding of St. Bartholomew's Hospital. The appeal may be regarded as safe in the hands of the City of London, to the corporation and citizens of which the foundation was entrusted by a Tudor king. The hospital, as the Duke of Gloucester reminded the diners, has lived through the reigns of 39 British sovereigns.

A national appeal to provide funds for the work being done on behalf of academic refugees will be made on Monday, 8.15 P.M., at a public meeting in the great hall of University College, London, when the Archbishop of York will preside. On the following evening at 8.30 P.M. the Society for the Protection of Science and Learning will hold a conversazione at Burlington House, when the presidents of the Royal Society and of the British Academy will receive the guests.

# SPECIAL ARTICLES

## THE SHORTAGE OF NURSES

### NEW PROPOSALS

THE Inter-departmental Committee on Nursing Services, appointed in November, 1937, by the Minister of Health and the President of the Board of Education, has not waited until it can present a complete report on its very wide terms of reference. The statistical material on which it proposed to base its final conclusions cannot yet be summarised, but the public anxiety about the maintenance of an adequate institutional nursing service has led it to make an interim report[1] on the most urgent of the problems presented to it. The introductory note acknowledges the help given to its consideration of nursing problems by the report (1932) of THE LANCET Commission on Nursing and adds: "... we think that many of the improvements which have been made in hospital conditions in recent years are directly attributable to the recommendations contained in that Report." It is common knowledge however that the shortage both of probationers and of trained nurses applying for work in hospitals has become more acute, relatively to the need, during the last six years. Besides endorsing most of the recommendations made in 1932 the committee has brought forward constructive new proposals and it is these that we propose to outline.

#### SALARIES AND PENSIONS

The committee is agreed that having regard to their great responsibilities nurses are badly underpaid, especially in the higher posts, even when their emoluments are taken into account. It deplores the competition between employing bodies for the available personnel as a method of raising salaries and suggests that pay and pensions should be treated on a national basis by the establishment, on the initiative of the Ministry of Health, of one or more committees similar to the Burnham committees, composed of representatives of employers and employees, which evolved national scales of salaries with regional application for the teaching profession. It is proposed that the cost of a general improvement in salaries (which cost will be increased by that of the employment of additional staff needed to carry out what is regarded as "another essential reform"—namely, the reduction of hours of duty to 96 per fortnight) should be met by two types of grant: (1) payable in respect of work done in training nurses and (2) payable in respect of increased expenditure incurred on nursing services. The first type of grant would be derived from national funds, available to voluntary and municipal hospitals alike, and administered centrally by the Ministry of Health; the second would be given only to voluntary hospitals and administered through the local authority.

These suggestions are subject to reservations signed by eight members of the committee. Three are unable to support grants specifically in respect of the training of nurses when the training-school is saving the hospital money by employing probationers to supplement the work of trained nurses. Three members are joined by another in a refusal to express any opinion as to the source from which grants should be provided to voluntary hospitals which are unable to carry out the recommendations of the report on salaries and hours of work; and four other members, though in full agreement about the need for improving salaries and conditions of service, do not regard the financial basis of the proposals as equitable in so far as large expenditure would be incurred by local authorities on what is regarded as a national problem. These reservations are conspicuous because among the many controversial questions considered a remarkable degree of unanimity has been achieved; only two other notes of reservation (to be mentioned presently) are recorded.

The committee is sure that pensions for nurses should be universal and interchangeable, but the difficulties of achieving this are clearly set out in a memorandum from the Government actuary in an appendix to the report. He suggests (and the committee concurs) that the most helpful line of approach is by the method known as "cold storage" under which each separate period of service earns a separate pension only when the employee ultimately retires.[2] The service counts for pension whether it is with a voluntary hospital or other body whose staff is affiliated to the federated superannuation scheme for nurses and hospital officers or under a local authority.

Though under this method the total superannuation rights earned may be less than those of a continuous service under one authority, the fact that a transfer from one service to another usually implies promotion may ultimately neutralise any loss. Attention is drawn to the fact that as both in voluntary and municipal hospitals superannuation contributions are paid on salary plus emoluments—i.e., estimated cost of board and lodging—it is unfair for the emoluments of nurses who live in hospital to be reckoned less for superannuation purposes than the cash allowances given to those who live out. The latter are therefore favoured. In view of the small number affected it is surprising to learn that witnesses assured the committee that this is already "a cause of great dissatisfaction in the profession"; but we agree that it might well become so if recommendations 22 and 27—in favour of extending the system of living-out for the trained staff and of the practice of employing married nurses—are adopted. Pending the establishment of salaries committees the anomaly could, it is suggested, be remedied by reckoning part of the cash allowance granted to a nurse who lives out as a non-pensionable emolument, rather than by throwing an extra financial burden on the hospitals by scaling up the salaries of all nurses living in.

#### HOURS OF WORK

The introduction of a 96-hour working fortnight, exclusive of time spent at meals, for all grades of institutional nurses both on day and night duty is a unanimous recommendation. Witnesses before the committee were agreed that only if this figure were reached could the nursing profession stand comparison with the hours worked in most of the alternative careers open to women. This view represents a definite (and, we believe, satisfactory) change of attitude to the question of hours of work, for only six years ago responsible nursing organisations in evidence to THE LANCET Commission regarded a 56-hour week spread over a fortnight—i.e., a 112-hour working fortnight—as a satisfactory maximum.

1. H.M. Stationery Office. Pp. 93. 1*s.* 6*d.*

2. This method was also recommended on the same advice by the committee on nursing set up by the Secretary of State for Scotland under the chairmanship of Lord Aness (see *Lancet*, 1938, **2**, 1086).

Then as now legislation to enforce a maximum was not generally favoured. The committee regards such legislation as both undesirable and unworkable in practice; pressure could, it holds, be brought to bear on any hospitals reluctant to introduce a 96-hour working fortnight either through the nursing organisations or, if necessary, through the recommended system of grants. Five members (in a note of reservation) do not agree that "the profession itself is resolutely opposed to having its hours of work regulated by statute" and believe that only by legislation—which would have to settle an "appointed day" some years in advance—would it be possible to ensure the institution of a 96-hour working fortnight at a reasonably early date.

The recommendation that extra work in an emergency should be recognised by additional hours off duty, rather than by payment for overtime, is unanimous.

### RECRUITMENT

The desirability of a central bureau to control recruitment is suggested. There is evidence, especially in London, that intending probationers may be discouraged and lost to the profession because the hospital to which they first make application has no vacancies. In some districts in the provinces a central office of this kind would perform a useful function both for voluntary and municipal hospitals. Such a bureau could establish effective contact between hospitals and education authorities and with girls leaving school; the bureau could supply information on qualifications required, on facilities offered and on prospects; it could keep a register of trained nurses and advertise in the press. The committee holds however that any official publicity campaign for nursing would be premature until the conditions of employment have been altered on the lines of its recommendations.

On balance of evidence the age of 18 is recommended as the minimum for entry to the wards of a general hospital, although 19 would be desirable. In the future it is hoped that special hospitals will be able to raise their age of admission to 18; in no case should any girl be allowed to start nursing duties under the age of 17, though younger ones may be employed in other hospital departments.

It is impossible, in the committee's view, to obtain enough probationers from girls educated at secondary schools; recruitment must be directed towards the elementary schools as well. The chief inspector of the Board of Education is quoted as authority for the belief that the best products of elementary schools are capable of becoming good nurses and would find little difficulty with the state examinations. The committee regards the resolution of the General Nursing Council to divide the preliminary state examination as the one step which can be of material value in bridging the gap between school and hospital. The secondary-school girl should be able, after a full course of one year's duration, to take part 1 of this examination (anatomy, physiology and hygiene); the ex-elementary-school girl who is in full-time employment will be required to spread a part-time evening course over two years. If she is not employed during the day she could fill in two years between 15 and 17 by study at a technical institution.

The committee does not favour special nursing scholarships at secondary schools, holding that any financial assistance to enable girls to continue their education beyond the age of 16 should be independent of the profession to be chosen by the pupil. Girls likely to be specially suitable for nursing might however be granted assistance by local education authorities even if they had not obtained the school certificate.

### THE TEST EXAMINATION

The examination in English, general knowledge and arithmetic, recently instituted by the General Nursing Council for girls who have not obtained the school certificate, has in the committee's view intensified the difficulties of recruiting probationers. It has deterred some girls from considering a nursing career, and has increased the burden on sister-tutors and on those probationers accepted at hospitals on the condition laid down by the General Nursing Council that they pass the examination within three months of entry. The sole function of such an examination should be to exclude from the training-schools those who are unlikely to pass their professional examination. The thesis that the test examination should not be obligatory on those who have passed the first part of the preliminary state examination is supported by convincing argument. The committee contemplates that the usual method of entry to the profession should ultimately be by way of a pre-nursing course in which general subjects, such as arithmetic, will be included. Meanwhile it is suggested that the age of admission to the test examination should be reduced from 17½ to 17, that the system of prior acceptance of the candidate by a matron should be discarded and that the scope of the examination should be made more suitable for candidates from an elementary school.

### WHITLEY COUNCILS

The recommendation that governing bodies of hospitals who have not recently revised their rules should do so with the assistance of probationers as well as of representatives of the nursing staff is a good example of the general tenor of the report, in its implied criticism of the current militaristic attitude to the trainee. This idea is developed into a suggestion that not only a nurses' representative council, with access to the matron, but one constituted on the lines of a Whitley council should be established in every hospital. The "staff side" should include representatives of the probationers and should meet regularly; a delegate from this side could settle by informal discussion with a representative of the "official side"—e.g., the matron—many minor questions which need never be brought up at formal (and infrequent) meetings of the full council. The important aspect of this proposal seems to us the tacit recognition that the matron in whatever maternal relation she desires to stand to her nurses is necessarily influenced by loyalty to their employers. Often hospitals undertake quite lightly responsibilities to patients which they cannot fairly fulfil without a much greater annual expenditure than was contemplated and such enterprises may press hardly on a depleted nursing staff. The dual rôle of the matron makes her position of divided loyalties a particularly difficult one. Her authority would not suffer and her position as go-between would be eased if the nurses' representatives had direct access to representatives of the governing body of the hospital at meetings where she would take her place on the "employer's side" where she really belongs, however zealous her private efforts to secure better conditions for her staff.

We agree with the committee that such a council might not only remove causes of friction but would give the nurses, including probationers, valuable

experience of the problems of hospital administration and enlarge their outlook. The committee envisages, in course of time, the development of a national council charged with the consideration of conditions of service in the broader aspects, but it holds that the first step to this end is the successful and universal adoption of local councils.

### A SECOND GRADE OF NURSES

The frank admission in the report that, whatever the improvement in recruiting, it will not be possible for some years (or perhaps ever) to carry on the nursing services of the country without the aid of "assistant nurses" clears the ground. The opposition in the profession to the official recognition of a second grade of nurses has been founded as much on the conviction that the basic training leading to state-registration is the minimum that will protect the public from the very real dangers of incompetence in private nursing, as on a natural desire to protect the status and economic position of registered nurses. But the fact that so many unregistered women are working in institutions (sent as "temporary" helpers from nursing coöperations), in nursing-homes, and in private houses, without any guarantee of the extent of their training, or of their character, makes it essential on all grounds to differentiate those capable of rendering useful service from others who are unsuitable for such work.

It has often been assumed that it is only the chronic sick who could safely be entrusted to the care of a second grade of nurse. The committee does not stress this point, but would restrict their employment in hospitals to work done under the supervision of a trained nurse. In domiciliary nursing the safeguard to the public would be licensing, registration and inspection by local authorities of all agencies and coöperations supplying private nurses. Such coöperations would be forbidden to supply nurses not entered on a state register or on the roll of "assistant nurses," and would be required to inform the patient which type of nurse was being sent out. The committee expresses the opinion that no women except those on the registers or the roll or those in training should "habitually and for gain" nurse the sick; but it reserves for further consideration a suggestion that legislative measures should be taken to secure this end. Existing "assistant nurses" should, they hold, be admitted to the roll, which should be placed under the control of the General Nursing Council, on evidence of competence, two years' experience and good character. In the future somewhat similar qualifications would be demanded of candidates over the age of 21.

No detailed consideration is given to a scheme of training, but importance is attached to preliminary approval of training institutions which would not normally but might in certain circumstances be hospitals also recognised as training schools for state-registered nurses. An excellent suggestion is that the test in practical nursing (there would be no written examination) which would be a condition of admission to the roll should take the form of an inspection by assessors of the candidate's work in her normal environment at her hospital. The service would, it is believed, appeal to older women dissatisfied with their present occupation and would release many state-registered nurses for more highly skilled work.

It is noteworthy that the recommendation for the recognition of a second grade of nurse, though endorsed in principle by all members, is subject to a reservation on nomenclature signed by the nurses on the committee. They advocate as an official designation that of "registered invalid attendants."

### CONDITIONS OF SERVICE

The general conclusions so far reached agree substantially with those formulated by THE LANCET Commission. They advocate reasonable notice of times off duty, preferably by means of the universal adoption of time-tables; the relief from hospital duties of probationers about to sit for a state examination; at least four weeks of annual leave, of which two should be consecutive; better accommodation in a number of hospitals; an extension of the living-out system for trained staff; the abolition of unreasonable rules and restrictions, and a more friendly atmosphere in hospital; the conduct of the nurses' home as a hostel; better facilities for recreation and the pursuit of social life outside the hospital; an improvement in catering, and the removal of vexatious restrictions regarding attendance at meals; the provision of domestic help for routine duties. It is recommended that a nurse confined to bed or absent from duty for more than twenty-four hours should be examined by a medical officer. Routine medical inspection of the nursing staff at intervals during training is carried out in Germany and is regarded by the committee as an admirable practice which might with advantage be adopted as a routine in British hospital practice.

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## HYDATIDIFORM MOLE AND CHORIONEPITHELIOMA

### MR. BREWS'S BLAIR-BELL LECTURE

AT the Royal College of Obstetricians and Gynæcologists on Jan. 27 Mr. ALAN BREWS delivered the second William Blair-Bell memorial lecture. It was based both upon his own experience and on an analysis of case-records from the London Hospital, comprising 100 consecutive cases of hydatidiform mole treated during a period of thirty-three years, 1905–37, and 26 consecutive cases of chorionepithelioma treated during a period of fifty-three years, 1885–1937.

### HYDATIDIFORM MOLE

Lamotte, said Mr. Brews, may have been the first, in the 18th century, to associate the terms hydatid and mole, and the first recognition that the hydatids are cystic dilatations of the chorionic villi was attributed to Velpeau and Madame Boivin (1827). Virchow (1853) still considered that the essential lesion was a degeneration, affecting the stroma of the villi, and the modern conception of excessive proliferation of syncytium and Langhans cells as the primary morbid change originated with Marchand's monograph (1895). That the term hydatidiform mole is not truly descriptive was evident from the fact that the fœtus may survive and be born as a living healthy child.

Excess of gonadotrophic hormone in the urine of patients suffering with this disease was first demonstrated by Fels and Ehrhart in 1929. Recently, with the aid of the dissecting microscope, Meyer had demonstrated chorionic vesiculation to a varying extent in nearly a third of a large number of spontaneous abortions examined.

*Ætiology.*—In the lecturer's opinion the available evidence points to the condition being a primary disease of the ovum.

The average *incidence* in seven obstetric hospitals in Great Britain was calculated by Das as 1 in 835 of their admissions, but this figure might represent an under-estimate of the general incidence, because the hospitals have insufficient accommodation to admit cases of abortion. The present series of 100 cases at the London Hospital gave an average incidence of 3 per year (the incidence of chorionepithelioma was 1 case every two years). As regards age-incidence, in the present series 3 patients were under twenty, but a third of the patients were forty or more. In 26 per cent. the mole was a first pregnancy, but the average fertility was 4 pregnancies and 0·6 miscarriages. Only 1 patient had had a previous molar pregnancy, and a follow-up of more than half of the patients had not revealed any subsequent molar pregnancies: therefore although Essen-Møller reported 18 collected cases of molar pregnancy, the possibility might safely be considered remote.

According to leading veterinary authorities hydatidiform mole appeared to be rarer in domesticated animals than in human beings, and chorionepithelioma was not recorded: neither condition had been recognised in any animal in captivity in the London Zoological Gardens during the last twenty years.

*Diagnosis.*—The presenting symptom in three-quarters of the series was abnormal uterine hæmorrhage following a period of amenorrhœa up to twelve weeks in duration, the latter being long in 20 cases—in 2 it lasted forty weeks—and absent in 8. Atypical cases, suggestive of carneous mole, were diagnosable only by biopsy. Clinically the uterus was as a rule larger than would be expected from the calculated duration of pregnancy; of 57 cases in which no molar tissue had escaped the uterus was larger in 41 (in 9 it was abnormally small, owing to partial or complete necrosis of the mole). Signs of pregnancy toxæmia at an unusually early period of gestation might be significant; of 56 cases in which the urine, uncontaminated with blood, was examined (often a catheter specimen) albumin was present in 21 (large amounts in 8). Œdema and hyperpiesis were recorded in a few cases.

In the lecturer's series ovarian cysts were palpable clinically in 8 out of 100 patients (3 with large bilateral multilocular lutein cysts with loculi up to 6 cm. in diameter; 5 with small unilateral cysts up to the size of a tennis-ball), while at laparotomy cysts were visible in 8 out of 10 patients. Excessive luteinisation was demonstrable at biopsy after ovariectomy in 5 ovaries from 3 cases where naked-eye ovarian enlargement was present and in 9 ovaries from 5 patients without any associated ovarian enlargement. Excessive luteinisation was apparent in one or both ovaries (with or without cystic enlargement) in the majority of molar pregnancies, since of the 14 ovaries removed from the latter 8 patients, multilocular lutein cysts (bilateral in 5 patients, large in 2 and small in 3, and unilateral in 3) were found in all except one ovary (from a patient aged forty-five). The 3 examples of large bilateral multilocular lutein cyst occurred in patients aged between twenty and twenty-four; of the 5 with a cystic ovary discovered clinically, only 1 (who later developed chorionepithelioma) was over thirty. The type of response therefore appeared to be related, among other factors, to the age of the patient.

In 20 cases certain diagnosis was made possible by the identification of expelled hydatidiform vesicles, and in 5 recent cases the radiographic report, "no fœtal parts seen," was of value, although there might be difficulty in distinguishing hydatidiform mole from an early twin pregnancy, which might also be associated with very high gonadotrophic hormone excretion. The Aschheim-Zondek technique of gonadotrophic hormone assay was employed in 6 of the lecturer's last 11 cases, where no part of the mole had escaped from the uterus; in 5 a positive reaction was obtained in a dilution of 1/200 (in 1 case up to 1/800) and in the remaining case a negative reaction was obtained in undiluted urine. In the former 5 the total urine injected varied from 2·4 to 3 c.cm., an amount corresponding to a urinary output lower than the standard suggested by Zondek as adequate for certain diagnosis; in fact an output of this level might occur in normal pregnancy at the peak (sixtieth day of gestation) of a three weeks' period of high excretion (even more frequently in multiple pregnancy). In 2 of the lecturer's cases during abortion the reactions (positive in undiluted urine) were negative in dilutions of 1/25 and 1/100 respectively, findings which were at variance with a case of Prof. James Young's during abortion, which gave a positive Friedman test in dilution of 1/600 and a negative at 1/700. Cases had been recorded of abnormally low or negative hormone assays in association with hydatidiform mole, probably representing examples of delayed or missed abortion of separated moles. Exploration of the uterus was the confirmatory or actual method of diagnosis in all cases where escape of vesicles had not occurred.

In 97 cases no uterine content other than molar tissue was identified: in 2 cases there was a twin pregnancy, a normal fœtus and placenta coexisting with a hydatidiform mole, and in 1 case there were multiple focal areas of vesicular degeneration in a placenta with a well-formed fœtus attached. The development of the fœtus in each case was about fourteen weeks.

*Treatment.*—Of the 100 cases medical treatment (supervision of the spontaneous complete abortion of the mole) was adopted in 12. Vaginal operation was performed in 79 cases: (*a*) induction of abortion was completed spontaneously in 7 cases and by digital evacuation in 6 cases; (*b*) exploration of the uterus was followed by immediate digital evacuation of the mole in 24 cases; (*c*) digital evacuation of retained mole was performed in 31 cases of incomplete abortion (30 spontaneous, 1 after induction); (*d*) after recent abortion (spontaneous or therapeutic before admission) the uterus was explored diagnostically in 10 cases; and (*e*) in 1 case vaginal hysterotomy was performed. Abdominal operation was undertaken in only 8 cases (1 hysterotomy and 7 hysterectomies). No patient received a blood-transfusion; 4 were given an intravenous infusion. One woman, admitted moribund, died of acute anæmia from hæmorrhage (mole still in utero).

The *mortality-rate* of 1 per cent. was compared favourably with a rate of 1·4 per cent. for 576 cases collected from 179 papers published between 1935 and 1937 (Albert Mathieu). In Sherman's consecutive series of 78 cases from the Lying-in Hospital, New York, the mortality was 2·5 per cent.

*Complications.*—Puerperal pyrexia, moderate and not exceeding fourteen days' duration, was evident in 39 (45 per cent.) of the 86 temperature charts at hand; convalescence was afebrile in 38, and severe pyrexia (parametritis 1 case, pyæmia 2, septicæmia 5, and 1 case of bilateral suppurating lutein cysts) was apparent in 9.

Secondary uterine hæmorrhage within a few weeks of expulsion of the mole occurred in 17 (18 per cent.) of 92 cases, excluding the 7 patients treated by hysterectomy, none of whom had postoperative hæmorrhage, and the 1 fatality. The biopsy of 10 of the 17

cases of secondary hæmorrhage suggested malignancy, and half of these were proved subsequently to have chorionepithelioma developing in the uterus.

Discussing the relationships of normal chorionic epithelium and malignant changes associated with chorionepithelioma, Mr. Brews said that spontaneous perforation of the uterus by hydatidiform mole had been recorded in 9 cases (1 of them in his own series). In this series the histological report on the primary products of abortion in 69 cases was in 51 cases "hydatidiform mole, benign," in 15 cases "probably malignant," in 2 cases "malignant (infiltrating myometrium)," and in the 1 case just mentioned "perforating hydatidiform mole" (after hysterectomy). The figures for those subsequently developing chorionepithelioma in the above groups were respectively 3, 3, 1 and 1—i.e., an incidence of 8 per cent. for the series as a whole (8·6 per cent. excluding the fatality and hysterectomy cases).

Apart from the 17 cases of secondary hæmorrhage, referred to earlier, secondary curettage was performed in 30 cases about six weeks after evacuation of the mole, as a diagnostic measure, but in none of the 30 cases was chorionepithelioma demonstrated—1 patient died however six months later from disseminated chorionepithelioma.

Control of aftercare with hormone assay was employed in 10 out of the last 11 of the lecturer's cases. In 5 of them the assay was negative in undiluted urine on the first occasion it was made, fourteen days, twenty-four days, four weeks and seven weeks after abortion of the mole, and eight days after a panhysterectomy respectively In 4 cases the first test was positive in undiluted urine only, three days, eight days, seven weeks and five months after abortion respectively. In a case of twin pregnancy (hydatidiform mole and normal gestation) very completely removed by abdominal hysterotomy, a positive reaction in dilution of 1/25 was obtained six weeks after abortion: in undiluted urine a positive reaction was obtained ten weeks after abortion and a negative reaction sixteen weeks after abortion.

CHORIONEPITHELIOMA

*Ætiology.*—Of the 26 cases 8 gave a history of recent hydatidiform mole, 7 of recent miscarriage, 5 of recent pregnancy of unrecorded nature, 4 of recent labour at term and 2 of recent teratoma of the testis. The age-incidence of the 24 females was as follows:—

| Age | Cases | Age | Cases |
|---|---|---|---|
| Under 20 .. .. | 1 | 40–49 .. .. | 6 |
| 20–29 .. .. | 6 | 50 and over .. | 2 |
| 30–39 .. .. | 9 | | |

Four patients were primigravidæ, 18 were multigravidæ. The site of the primary growth was in 17 cases the body of the uterus, and in 3 cases the body and cervix, the cervix, and a fallopian tube. In 4 cases there was no primary growth in the genital tract, owing probably to spontaneous resolution, with survival of a metastasis.

*Prognosis.*—A third of the women (8) survived for not less than five years; 2 others probably survived, while 14 were known to have died. The average duration of the history before admission of the 10 probable survivors and the 14 fatal cases was respectively eight and thirteen weeks. Of 8 cases that followed hydatidiform mole 6 survived in good health for more than three years, but 4 cases following labour proved fatal. Operation was not considered possible in 7 of the 14 subsequently fatal cases, and 2 patients treated by abdominal panhysterectomy died—1 a month later of pyæmia and secondary metastases in the lungs, the other nineteen days later from cerebral metastasis (present before operation). Another patient had a vaginal hysterectomy, and in the remaining 4 laparotomy resulted in fatal hæmoperitoneum. Apart from the latter immediate cause of death, cerebral metastases were responsible in 5 cases, septicæmia in 4, and pulmonary metastases in 1. Of 14 cases examined post mortem metastases were present in the lungs in 9 (64 per cent.), in the vagina in 7, in the brain in 4, while liver, intestinal, renal, suprarenal, cardiac, splenic, ovarian and bone metastases were each present in 3 cases.

By a colour film, paintings and photomicrographs Mr. Brews demonstrated the spontaneous resolution of a vaginal metastasis in a case of chorionepithelioma (following labour at term) which was successfully treated by panhysterectomy; a table demonstrated the conversion of the Aschheim-Zondek reaction from positive to negative simultaneously with the spontaneous resolution of this metastasis.

## MEDICINE AND THE LAW

### Thrombosis after an Injection

Cotton *v.* Treissman, tried before Mr. Justice Greaves-Lord last week, was a case in which everyone must sympathise with the plaintiff's misfortunes. Miss Cotton entered the Kent and Canterbury Hospital in 1934 for treatment for kidney trouble. In mid-December an X-ray photograph was taken but was not satisfactory. She returned on Dec. 31 for an injection of Uroselectan B for the purpose of further X-ray examination. Mr. Treissman, then house surgeon, made the injection. It was common ground that he tried to make it in the arms, first one and then the other, but failed because the veins were not visible; he tried the left leg and found a suitable vein. When he left the patient there was nothing in her condition which required further treatment; he was going to another appointment next day in any case and he never saw her again. Some 15 months later Miss Cotton wrote a letter complaining of her treatment at the hospital; she said she had suffered continuously from thrombosis since the treatment and this had developed into chronic phlebitis. Swelling had gradually spread up the left leg; the next symptom was a clot on the chest, which caused extreme pain; the swelling then spread down the right leg. She was 52; she had lost her appointment and her pension. She had to use an invalid chair but could now get about with a walking-stick.

A medical practitioner does not insure the success of treatments or operations. He is not liable to pay damages unless he has been at fault; the patient who charges him with negligence must specify the acts or omissions which amounted to negligence. Miss Cotton's statement of claim was not delivered to Mr. Treissman till 1937. The alleged particulars of negligence then included a complaint that the defendant was at fault in injecting by a puncture when the vein was unsuitable for that method. Mr. Justice Greaves-Lord observed that for a long time the case as regards that head of negligence was almost entirely confined to the suggestion that the defendant preferred a vein in the leg to a vein in the arm. But a medical witness who gave evidence on behalf of the makers of uroselectan said definitely that any vein, if on the surface and suitable in size, was proper for the injection. This statement, said the judge, disposed of that head of negligence. X-ray photographs, taken

at the time, showed a perfectly normal circulation of the uroselectan through the blood-stream. This fact seemed not without relevance to other allegations of negligence—namely, that the defendant had failed to make sure that the needle had effectively located the vein, and that the injection was made without having placed the plaintiff in such a position as to secure adequate distension of the vein. Miss Cotton's advisers apparently did not contend that uroselectan was a drug which, by reason of its dangerous qualities, it was negligent to use. The real essence of her case was that some small part of the drug either leaked back from the vein or was inserted outside the vein and thus, by setting up local inflammation, involved the vein wall and caused thrombosis. In fact, so far as the reports of the case indicate, the plaintiff was saying "This is a perfectly proper drug but you failed to inject it into the vein," whereas the defendant was saying "I did inject the drug into the vein; had I failed to do so, certain symptoms would inevitably have appeared but they did not appear; but, even when the drug is correctly injected into the vein, no one can guarantee that thrombosis will not occur." Mr. R. T. Payne, of Harley Street, giving evidence of his examination of Miss Cotton, said that she might have been predisposed to thrombosis; he felt quite sure that her condition was due to injection into the vein; intravenous injection was much more likely to cause clotting than an injection of the fluid into the neighbouring tissues. So also Mr. Naunton Morgan, of Harley Street, said that, if doctors desired to produce thrombosis deliberately, they injected into the vein and not into the tissues. Mr. Morgan, who had made about 100 injections of uroselectan, described his own experience of an injection of it. The prick was only like that of a pin, but the pain up his arm was as much as he could stand and he felt like jumping off the couch. Some people, said Mr. Morgan, had a tendency to thrombosis; the medical reason was not known.

In giving judgment next day the judge referred more than once to our ignorance of the origin of thrombosis. He could not decide against Mr. Treissman unless it was shown affirmatively that he had done something which he ought not to have done, or had shown some lack of care. The plaintiff had wholly failed to prove any such thing; there must therefore be judgment for the defendant with costs. Mr. Treissman is a member of the Medical Defence Union.

### Consolidated World Research Again

A doctor got his money back from the Consolidated World Research Society in a recent action in the Westminster county court on the ground of the fraudulent misrepresentation made to him by an agent of the society. The plaintiff first received a letter from the society's head office; he next received a telephone call from the society's representative, Mr. Hamer, and an appointment was made. At the interview the doctor was given to understand that the encyclopædia marketed by the society was a medical publication. "I have," he said, "an encyclopædia of medical knowledge, but it is getting out of date." Mr. Hamer replied that the society's encyclopædia was the very thing for him; most encyclopædias went out of date the moment they were published, but this one was kept up to date by quarterly supplements. Mr. Hamer produced a list of persons who, he said, answered questions in connexion with the research facilities which were another part of the benefits obtained by the subscriber. In the county court the society said that the list was not one of consultants but one containing the names of persons who would be willing to give satisfactory references about the encyclopædia. On the list were the names of two persons known to the plaintiff doctor; on gathering that they would answer research questions and on being shown what was alleged to be an answer to a research question given by an eminent consultant, the plaintiff entered into the contract. Apparently the defendants produced two lists at the trial and contended that anybody who looked at the lists would realise that the encyclopædia was not a medical encyclopædia because the lists contained many names which were not those of medical men. The judge remarked that list A certainly contained many non-medical names, but list B contained only one man not medically or dentally qualified and he was a doctor of divinity. Oddly enough in list B he was described as "Dr.——," whereas in list A, where his name also appeared, he was described as the "Very Reverend——."

Counsel for the defendant society suggested a little heartlessly that it might well be the plaintiff's own fault if he was such a fool as to be taken in. The judge, however, cited Lord Halsbury's famous dictum: "If by a number of statements you intentionally give a false impression and induce a person to act upon it, it is none the less false although, if one takes each statement by itself, there may be a difficulty in showing that any specific statement is untrue." Taking the case as a whole, the court was of opinion that material misrepresentations were made by Mr. Hamer and that they were made for the purpose of inducing the doctor to enter into a contract, and that, in consequence of those misrepresentations so made and intentionally untrue to Mr. Hamer's knowledge, the plaintiff did enter into the contract. Fraud, said the judge, was a serious matter to allege and the proof must be definitely established. The plaintiff had proved his case. The contract would be rescinded and the £19 10s. which he had paid to the society would be refunded.

The plaintiff was represented by the London and Counties Medical Protection Society of which he is a member. Other medical men who have become involved with the Consolidated World Research Society would be well advised to consult their defence union. Perhaps the defendants will now leave the medical profession alone if they cannot curb the excessive zeal of their salesmen.

## THE LANCET 100 YEARS AGO

*February* 2, 1839, *p.* 690.

*From a report of some clinical remarks delivered at St. George's Hospital by Sir Benjamin Brodie.*

ABSCESS OF THE TIBIA.—A man was brought into the operating theatre with an enlargement of the upper end of the tibia; the skin covering it was tinged with a red inflammatory blush; which, however, did not cause much pain on manipulation. The patient was under Sir B. Brodie's care, who diagnosticated "abscess in the substance of the bone." A crucial incision was made down to the spine of the tibia, the periosteum scraped off, and the trephine applied. In a few minutes a drop of pus appeared in the interstice, and when the circular portion of bone was removed there was discovered a collection of pus (about two teaspoonfuls), which gradually rose from its cavity in the cancellous structure to the anterior and superior edge of the shaft, from the contraction of the osseous walls, which had been expanded outwards by the dilatation of the abscess within. "See, see," said Sir B. Brodie, evidently delighted beyond measure at the accuracy of his own diagnosis, which now stared every one in the face; the pus was absorbed up by some lint, some cool dressing applied and the man removed to bed.

# THE AIR-RAID

*A series of articles on medical organisation and surgical practice in air attack by*
P. H. MITCHINER, C.B.E., T.D., F.R.C.S., *and* E. M. COWELL, D.S.O., T.D., F.R.C.S.

## V—INFECTION: GAS GANGRENE: TETANUS

ALL wounds must be regarded as infected from the start for the following reasons. The micro-organisms are introduced both from the patient's skin and from the overlying clothing, fragments of which are often carried into the depth of the wound by the projectile. Moreover, the projectile has often already struck some surrounding object and is therefore a potential source of infection. All missiles must be regarded as infected, but machine-gun bullets, though they pass through soiled clothing and unwashed skin, do not tend to carry the clothing into the wound; they also often ricochet before striking the patient, and for this reason the infection in penetrating wounds from this source is more superficial and therefore more amenable to treatment. Very different is the case of the low-velocity projectile and irregular fragments from bombs and shrapnel, where clothing, grease, and dirt are carried into the wound and gross infection is the invariable rule if the patient survives long enough.

### TREATMENT OF INFECTION

*Prophylaxis.*—Every type of micro-organism may be introduced into the wound, and for this reason the only sound treatment is early excision of the wound track and surrounding damaged tissues in every case. Success cannot be expected if the excision is postponed for a longer period than twelve hours after infliction of the wound, but in some cases, in which the organisms are of low virulence and the damage to the skin is not very severe, success may follow excision up to twenty-four hours after infliction of the wound. With penetrating wounds very severe infection may occur in the deep tissues, while a small punctured surface wound may have healed soundly apparently by first intention. In these cases deep pain and tenderness, accompanied by rapid pulse-rate and hectic temperature, show that infection may have progressed far before being detected, for neither the pain nor the tenderness is evident before there is considerable tension in the tissues, and this does not happen by any means immediately where the tissues have been extensively disrupted round the wound track—a condition commonly caused by high-velocity bullets. Such wounds are infected much more in the superficial part. When, therefore, a very complicated track involves deep viscera and important structures which cannot be excised, it is worth while to excise the superficial part of the wound track while at the same time exploring for embedded shreds of clothing and to ascertain the extent of the damage. If infection is expected or suppuration is already present, the wound track must be adequately drained. In lacerating wounds infection is more obvious and manifests itself earlier by redness, œdema, and purulent discharge from, or spreading cellulitis round, the wound. When muscle is involved, a special watch must be kept for gangrene infection, which begins in the damaged muscle tissue and, being due to anaerobic organisms, is much favoured by suppuration and infection, which uses up the oxygen in the damaged muscle tissue.

*Cure.*—When infection is established, conservative treatment—hypertonic saline dressings frequently changed and the provision of adequate drainage—is essential; but, if suppuration tracks into the surrounding tissues, incision must be made to secure drainage of the pockets of pus round the wound. So soon as any signs of infection appear in the wound, the part concerned must be put at rest and maintained thus if necessary by adequate splintage; for this purpose skeleton splints are most suitable, for they allow the wound to be dressed without disturbing the rest of the limb.

In deep wounds, in which adequate drainage is impracticable, irrigation with small perforated rubber tubes (Carrel-Dakin) may be carried out (fig. 1). A 10 per cent. solution of hypertonic saline or some very bland antiseptic—e.g., a 1 per cent. solution of gentian violet or a 1 in 1000 solution of acriflavine—which will not damage the surrounding tissue cells should be used. The irrigation should be kept up continuously, for it is the mechanical washing far more than the action of the antiseptic that is responsible for any improvement.

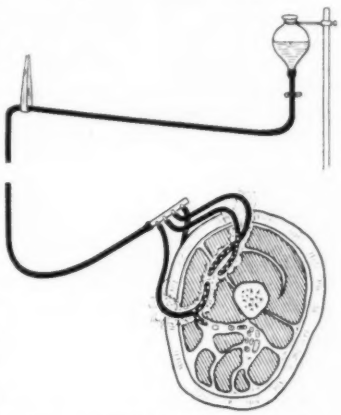

FIG. 1—Carrel irrigation apparatus.

*Spreading subcutaneous or cutaneous gangrene*, an insidious and steadily spreading infection of the skin and subcutaneous fat, occasionally starts round a chronically infected wound. Its ætiology is not known, but culture reveals a pure growth of streptococci in nearly all cases. Deep sutures producing tension on the surrounding tissues undoubtedly predispose to this infection. A few days after operation intense pain develops near the wound, accompanied by a dusky purplish discoloration and œdema of the surrounding tissues. Great and very distressing pain persists throughout the entire illness. If untreated, the skin slowly breaks down, while the subjacent fat becomes an infiltrated purulent slough. The ulceration spreads slowly but steadily, unless treated, and may involve as much as half the body surface. Apart from the intense pain and debility from loss of sleep, there is usually little general toxæmia though the temperature tends to be hectic. Treatment must be prompt and early. It consists in excising the infected area about half an inch beyond the obvious edge of the infection or, alternatively, in isolating it by diathermic incision down to the deep fascia. In very extensive and neglected cases this treatment may be supplemented by curettage and ionisation with zinc salts. After excision epithelialisation and healing take place rapidly and the pain disappears almost immediately.

### GAS GANGRENE

This type of gangrene, also called acute spreading gangrene, is always due to infection with spore-forming anaerobic bacilli of various types: (1)

sugar-splitting bacilli, including *Bacillus perfringens* (*B. welchii*); (2) proteolytic organisms, including *B. sporogenes*, *B. aerogenes capsulatus*, and *B. œdematis maligni*, which are found in soil, especially if cultivated and manured; they are normal inhabitants of the intestines and can multiply very rapidly under favourable conditions, such as in the depth of a wound, more especially if there are aerobic pyogenic organisms in the tissues. Under favourable conditions they can form highly refractile and resistant endospores, which can survive prolonged boiling and later develop when conditions become favourable—i.e., in the absence of oxygen.

Muscle, owing to its large content of glycogen, is particularly favourable, especially if damaged, to

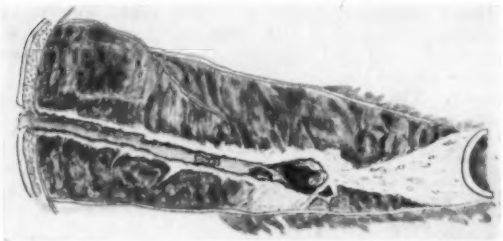

FIG. 2—Early gas gangrene. Part of vastus lateralis muscle one hour after death, which took place twenty-four hours after patient was wounded. The dark body is a shell fragment with a track leading to it from the left edge of the preparation. The track of the missile is lined by a thin layer of pale infected muscle covered with pus. In several places the infection is spreading into that part of the vastus lateralis occupying the lower part of the illustration. The triangular area towards the right is a mass of gas-containing tissue in the muscle attached to the femur. Along the bottom of the preparation can be seen the lateral intermuscular septum. (After the *Journal of Pathology and Bacteriology*, 1917.)

the development of this type of gangrene; indeed, many observers consider that gas gangrene always starts in the muscles. Certainly it extends more rapidly and extensively in muscle than in any other tissue, but it undoubtedly sometimes starts in cellular tissue. When a muscle is affected, the gas spreads rapidly throughout the whole group of muscles, but often it may be localised to the one muscle in the early stages, especially when the blood-supply of the affected muscle is impaired while that of surrounding muscles is intact. The changes in colour of the affected muscle are very constant. The acid produced by the rapid growth of the organisms changes the hæmoglobin to hæmatin. In the earliest stages, therefore, the muscle-fibres along the track are bright pink. Next the healthy red appearance vanishes, and the muscle looks swollen, puffy and dull. When snipped with scissors it is non-contractile, and an excised fragment sinks in water. In 2–6 hours gas may begin to form. It may be produced in such quantities that the whole thigh, for instance, may become blown up and tympanitic. If the wound is confined to a single muscle, the infection spreads up and down the injured muscle and does not spread through the fascial compartments into the neighbouring muscles (fig. 2). If operation is impossible, the pathological changes continue to advance rapidly. The colour becomes darker as the blood-pigment is further destroyed, rapidly changing through green to brown and finally black. Bubbles of gas now appear between the muscle fasciculi—on section the tissue has a honeycomb appearance, and portions will float in water. Some of these changes can be demonstrated by perfusing a portion of fresh muscle with weak hydrochloric acid through an attached artery. This changes the normal red to a bright pink. If a solution of sodium bicarbonate is next injected, the specimen blows up with gas. In the early stages the gas produced is odourless, consists of carbon dioxide and hydrogen and is often inflammable; later it becomes highly offensive owing to the production of hydrogen sulphide and indols from the proteolytic action of *B. sporogenes* and its allies.

The local signs of the onset of gas gangrene may be noticed very shortly after infliction of the wound, although in some cases they may be delayed for a few days. The wound usually looks unhealthy, and its edges are often white and pouting, though the surrounding skin soon assumes a dusky hue and later becomes swollen with gas. There is a brownish watery discharge, which may be very free and often contains bubbles of gas; colourless at first, it is later foul and very fetid and can be smelt at some distance from the patient. The affected area is swollen and tympanitic to percussion, and crepitation can be detected in the tissues owing to the presence of the gas, which spreads along any invaded muscle far beyond the limits of the wound. If much gas is present, a radiogram will show the affected muscle or muscles to be abnormally clear and to appear foamy; but no time should be wasted in radiological diagnosis.

The general signs will be modified according to the type of gangrene, but any patient with persistent tachycardia should be viewed with great anxiety as likely to be infected, unless it is known that there is an arteriovenous wound. The types are: (1) localised, (2) restricted to one group of muscles, (3) generalised in the affected limb—the "massive" type—and (4) fulminating. In the *localised type* the signs of general infection are slight, there being a raised temperature, often accompanied by rigors and vomiting. The pulse-rate rises and the blood-pressure falls. The gas remains localised to the area of the wound, and a fatal result can be averted by prompt treatment. In the *group type* the general signs of toxæmia are much more severe, delirium is often present, and the patient suffers acute pain in the limb, the affected muscles being swollen and tender and often sloughing through the discoloured skin. The *massive type* is always associated with serious injury to the main vessels of the limb and may affect a limb already dead from this cause, in which event the general signs are usually mild. In the acute primary variety constitutional disturbance is severe, and often there is a rapid pulse-rate with a normal or subnormal temperature, a sign of very grave import. The patient's pallor suggests that severe hæmorrhage is still taking place, but there are profuse sweating and great restlessness, with no air-hunger. In the *fulminating type* the gangrene spreads with alarming rapidity, and the whole body may be converted into a putrescent mass in a few hours. The mental condition usually remains clear, and death occurs rapidly and very suddenly. Such a patient has been known to die with a freshly lit cigarette between his lips. The tongue is brown and dry, the facies drawn and pale, the pulse-rate rapid and irregular, the temperature subnormal, and vomiting severe.

The differential diagnosis of gas gangrene from other types of surgical emphysema is usually easy,

for in the latter there are no toxic signs, though it must be borne in mind that the trauma preceding the emphysema may cause considerable shock. Surgical emphysema other than from infection with gas-forming organisms is limited to the regions of the gas-containing viscera, though in the later stages it may spread widely. If any wound is treated with hydrogen peroxide, the gas liberated on its contact with damaged tissue will penetrate for some distance into the cellular tissue and produce crepitus. Care must be taken not to mistake this for gas due to the presence of organisms. The patient shows no general signs of toxæmia and the gas disappears in a few hours.

Prophylaxis consists in the immediate and free removal of all infected tissues, special attention being directed to the muscles, which may have to be entirely excised. The wound should be left open and exposed to the air and dressed or, better, irrigated with hydrogen peroxide or some strong antiseptic, such as Dakin's solution. Secondary suture can be performed later, when the infection has been overcome. The injection of hydrogen peroxide into the tissues round the infected area is undoubtedly of value in limiting the spread of the infection after treatment of the gangrenous area. In the localised type excision and free incisions may be tried, with entire removal of the infected muscles. Amputation of the affected limb proximal to the gas-containing region is often necessary in the group type and always in the massive type. Since the gas has spread far along infected muscles, amputation should be performed well clear of the gas area and must always be of the circular type, usually by the circular cuff method, the skin being sewn back. *B. welchii* antitoxic serum should always be administered, usually 40 c.cm. intramuscularly. In the fulminating type local treatment should be attempted only if the gas is sufficiently localised for there to be any reasonable hope of dealing with the infected area, and even in these cases the chances of averting death are small.

Tourniquets, tight bandages, splints, and anything else likely to impair the blood-supply to the damaged area should be avoided. Tight plugs and antiseptic pastes should never be used, for these preclude aeration, and for the same reason dressings should be changed frequently. If there is suppuration the wound should be irrigated continuously with Carrel-Dakin tubes, for the pyogenic organisms are aerobic and their presence favours the growth of anaerobes. Maggots may be found in neglected wounds of this type and aid the cleansing, and their presence is of good prognosis, for they do not flourish in the wounds of moribund patients. Permyase may be used as a liquid or a jelly for dressing the wound to achieve the same result.

### TETANUS

The spore-forming *B. tetani* is strictly anaerobic, is widely distributed in all soil and dirt contaminated with horse dung or fæces of any description, and may thus be present in any garden soil or street dirt. Tetanus is very likely to supervene in wounds of the foot resulting from the penetration of rusty nails, often from the boot sole. The organism flourishes in the immediate vicinity of the wound, especially in association with pyogenic organisms which use up oxygen, and for similar reasons it is particularly liable to grow freely at the bottom of a deep punctured wound, if this become infected. During the Great War it was found that most of the wounds contaminated with soil from vineyards and with mud from the trenches became infected with *B. tetani*, which grew much more rapidly if pyogenic organisms were also present. Gas gangrene also occurs in these conditions; but, whereas *B. tetani* remains strictly localised to the area of the wound and causes sapræmia by absorption of its toxins, gas-forming organisms spread rapidly throughout the tissues by the blood-stream. The presence of the tetanus toxin in wounds greatly favours the rapidity of the multiplication of the bacilli, and indeed when there is only a small amount of the toxin the bacillus will not develop and multiply; for this reason any wound suspected of being infected must be excised or freely drained.

The *clinical signs* of tetanus are mainly general, for locally the wound presents no special characteristics, though it is usually inflamed; indeed the infected place may be so minute as to escape detection. A smear should be taken from the deeper part of any wound, for this may reveal the presence of *B. tetani*. The general signs appear after an incubation period which may vary from two days to over three weeks, according to the time taken by the toxin to travel to the central nervous system and depending on the virulence of the toxin—i.e., the amount necessary to produce the spasms, which generally begin in 10–18 days after infection. Not infrequently the muscles round the wound are tender and rigid, but this is often attributed to their inflamed condition. Next, the muscles of the back of the neck become stiff and rigid; the sternomastoids stand out as ribbon-like bands, and the head is held stiffly, with the chin a little elevated. This is accompanied by spasm of the temporal and masseter muscles and inability to open the jaw freely (trismus), together with a generalised spasm of the facial muscles, which produces the typical tight-lipped grin of the tetanic patient (risus sardonicus). Later, dysphagia from spasm of the œsophagopharyngeal musculature is not uncommon, and by this stage the jaw is held tightly closed, a condition which gives the disease its popular name of "lockjaw." Generalised rigidity of the body muscles now supervenes, together with some respiratory distress owing to the diaphragm and intercostals being affected, and indeed in the later stages the continued spasm of the respiratory muscles often causes death. Throughout the disease severe clonic spasms supervene on the tonically contracted muscles, and these are often excited by any disturbing external stimulus, such as the slamming of a door or handling or attempting to feed the patient, who should therefore be shielded as much as possible. During these spasms muscles may contract so violently as to rupture, this accident most often affecting the rectus abdominis. Owing to the greater power of the erector spinæ and gluteal muscles, the body is usually arched backwards (opisthotonos), the abdominal muscles being contracted and the abdomen retracted and board-like; more rarely the body is bent forward (emprosthotonos) or sideways (pleurosthotonos). The continual muscular cramp causes severe and often agonising pain, and the temperature is often considerably raised, but the mind remains clear to the end, the patient being acutely sensible of his condition. There is profuse sweating, and the urine is scanty and often contains a fair amount of albumin.

*Cephalotetanus* (*tetanus paralyticus*) is uncommon but, when it occurs, is always associated with wounds of the head and neck, especially the forehead. The first sign is a paralysis of the facial muscles on the side of the injury, not necessarily those supplied by the seventh cranial nerve only, for squint and diplopia are fairly common from paralysis of the oculomotor and abducent nerves. Trismus due to spasm of the

masseters and temporals soon develops, and there may be very great difficulty in swallowing, attempts at which are followed by violent spasm of the pharyngeal constrictors, giving this type of the disease the name of tetanus hydrophobicus. The mental condition of these patients is usually one of great excitement, and they may get attacks of acute mania, in which they are liable to inflict damage on themselves and their attendants; occasionally an attack of maniacal frenzy is the first sign of the disease.

The *prognosis* is always unfavourable in acute tetanus and should be guarded even in chronic cases. The length of the incubation period, if known, is a most important guiding factor; speaking broadly, all cases occurring under five days are fatal, from five to ten days 95 per cent. succumb, from ten to fifteen days 75 per cent. die, from fifteen to twenty-one days the vast majority of patients recover. The prognosis is always worse when the wound has been inflicted on the bare flesh.

The diagnosis may present some difficulties, but the thin-lipped grin, combined with the upflung chin, should enable the trismus in the early stages to be distinguished easily from that due to dental causes. In the later stages, when convulsions have appeared, the fact that the muscle spasm remains in the intervals is pathognomonic of tetanus.

*Prophylaxis.*—The treatment of tetanus can be best summed up in the well-known adage "Prevention is better than cure." Prophylaxis can now be aimed at by the administration of toxoid to all those likely to be infected, for this substance stimulates the active development of antitoxin. In all cases of wounds antitetanic serum should be injected. With these prophylactic injections, which must be given as soon as possible after the infliction of the wound, the incidence of tetanus among the wounded in the Great War, which was at one time so high as to threaten to become a scourge in the army, was reduced to practically nil, and in those few cases in which the disease developed it was because antitoxin had either been refused or not administered early. In ordinary circumstances 500 units of antitoxic serum should be injected intramuscularly, but if the wound is strongly suspected to be infected 1500–3000 units should be given. If the serum is warmed to body-temperature by immersing the ampoule in hot water many of the disagreeable sequelæ, such as joint-pains and urticarial rashes, which often appear a week or ten days after injection, can be avoided or much minimised in severity.

*Cure.*—Once the disease has manifested itself, energetic and prompt measures must be adopted, the three main principles being: (1) to prevent, by injections of serum, further absorption of toxin; (2) to control the spasms and prevent exhaustion or asphyxia; and (3) to maintain bodily strength. The patient should be placed in a quiet darkened room, an anæsthetic administered, and the wound, if obvious, freely opened up and packed with hydrogen peroxide 10 vols. or excised completely to stop the formation of toxin. Antitoxic serum must be introduced into the body to stop the action of the toxin already absorbed, an easy task when this is circulating in the blood; but when the toxin has combined with the cells of the central nervous system its effects are difficult to combat and death often follows from the spasms in spite of energetic treatment. It must be understood clearly that the antitoxin has no effect on the bacteria themselves, for the destruction of which the action of the phagocytes and antibodies, together with oxidising agents, such as hydrogen peroxide, must be relied on; hence the necessity for the active treatment of the wound. The antitoxin should be given in large doses—15,000–60,000 units—and a similar dose should be administered daily for the next two days, and then again at the end of the week. To diminish the bulk of liquid to be introduced a specially concentrated antitoxic serum has been prepared; or the German serum, which is sixty-six times as concentrated as the British and United States serum, may be used for this purpose. In whatever form the antitoxin is given, care must be taken that it is sterile and given under antiseptic precautions; and, if the serum is of old stock, allowance must be made for deterioration in the proportion indicated on the phial. The antitoxin should be administered intrathecally after the withdrawal by lumbar puncture of a quantity of cerebrospinal fluid equal in amount to the bulk of the serum to be introduced. This operation must always be done under anæsthesia in tetanus, lest a sudden spasm snap the needle; the spinal canal may be entered in the lower cervical region, but this is not without risk of damage to the cord. Intravenous injection of serum seems to be of benefit in the fulminating tetanus and can be given in saline when liquids cannot be swallowed; otherwise it has nothing to recommend it above intramuscular injection, which is easier, and from which the serum is more slowly absorbed and eliminated. The best point for this method is midway between the top of the great trochanter and the iliac crest. These methods may be used in combination or alternatively, but it is not advisable to administer two consecutive intramuscular doses at the same spot.

Subcutaneous injections of a 1 in 20 solution of phenol and intrathecal injections of magnesium sulphate have been used to allay the spasms, but their results are disappointing and their use now generally abandoned in favour of antitoxin. Curarin has been given by continuous intravenous drip, but this must be used cautiously, for it is a cumulative paralysant of all muscle and in some cases has caused death from cardiac failure. In addition, the patient must be quietened by the administration of some narcotic, such as chloral, potassium bromide, or Nembutal, which must be given freely. Inasmuch as these require some hours to act they often need supplementing in the first day or so by injections of morphine, which may have to be used freely to control the spasms. Catheterisation of the bladder may be necessary. Avertin has also been used extensively in doses rather larger than those required in basal anæsthesia. The patient may be kept more or less continuously under it for several days. Artificial feeding under anæsthesia has often to be resorted to, but the induction of anæsthesia is invariably accompanied by severe and sometimes fatal respiratory spasm. Care must be taken to eliminate all sources of external irritation, such as draughts, bright lights, and noises, which often start severe clonic spasms.

*Active immunisation.*—In a valuable paper (*J. R. Army med. Cps*, 1938, **70**, 289) Major J. S. K. Boyd, R.A.M.C., of the department of pathology, points out that in the first two months of the Great War, before antitetanic serum (A.T.S.) was given, 8 cases of tetanus occurred per 1000 wounded. As soon as a prophylactic dose of 500 units was given, the incidence fell to 1 per 1000. Later it was found necessary to give up to four prophylactic doses to every wounded man, and the incidence was still lowered, as well as the mortality of contracted tetanus. Antitoxin prophylaxis has the following disadvantages: (1) A.T.S. should be

given as soon as possible after the reception of a wound, but this is not always possible; (2) the passive immunity conferred being transitory and probably not lasting more than a fortnight, a weekly repetition is therefore necessary in many cases; (3) serum sickness occurs in about 10 per cent., anaphylaxis may prove dangerous, and later it may be impossible to administer horse serum, because of the sensitisation produced by the A.T.S.; and (4) the infection may be so intense that the antitoxin given is not potent enough, and tetanus may supervene. (In the present fighting in Spain many cases of tetanus have occurred in spite of prophylactic A.T.S.—possibly consequent on the immediate use of plaster-of-paris.)

Owing to the work of Ramon and others at the Pasteur Institute, it has been found that toxin, treated with weak formalin and incubated at 37° C. for a month, loses its toxic action but retains its antigenic properties. This toxin was called "anatoxin" by Ramon, but it is better termed "toxoid." Inoculations of toxoid produce no ill effects. A subcutaneous injection of 1 c.cm. is given, followed a month later by one of 1·5 c.cm. and 10–15 days later one of 1·5 c.cm. The result of the third or "boosting" dose is to raise the antitoxin of the patient to 1 or more units per c.cm. of serum. In a series of men examined five years later a satisfactory degree of immunity against tetanus was still present. Boyd states that "there is good reason to hope that in time it will be shown that toxoid confers a solid immunity against tetanus of long—possibly lifelong—duration"; but, though such an active immunisation may be possible among troops, it presents many difficulties as a routine prophylaxis among the civil population, at any rate before the beginning of hostilities.

# PANEL AND CONTRACT PRACTICE

## Health and Unemployment Insurance Compared

THE American Social Security Board, which has been charged with the duty of "studying and making recommendations as to the most effective methods of providing economic security through social insurance," is conducting a series of studies of foreign social insurance systems, and has just published, as the first of the series, a report on insurance against illness and unemployment in Great Britain.[1] The object of the study was to ascertain whether the benefits provided for workers unable to work from inability to obtain employment are comparable to those for workers whose inability to work is due to incapacitating sickness. In one respect the two systems are comparable—namely, the provision of cash benefits for temporary interruption of employment and wages. Provision of this kind is an element of both systems. There are other elements peculiar to the one or the other—e.g., the medical services of health insurance and the employment-finding work of unemployment insurance. The report makes no attempt to deal with these; it is limited to a historical and comparative study of the provision made for cash benefits. The subject is discussed with remarkable ability, and the report will repay study by workers in social insurance in this country.

Stress is laid on the wide divergence of the two systems since they were both established by the same Act in 1911. It is pointed out that while health insurance has remained relatively static, unemployment insurance has been "rapidly and consistently liberalised." It is true that the health-insurance cash benefits were increased in 1920, but the contributions were also increased and both changes were consequent upon the reduced purchasing power of the currency. Unemployment-insurance benefits have, on the other hand, been repeatedly increased, dependents' allowances have been added, and the proportion of the total cost borne by the taxpayer is now far in excess of the corresponding state contribution to the health-insurance system. Yet the monetary needs of the incapacitated worker are no less than those of the worker unable to obtain employment; and the report quotes the opinion of the Royal Commission on National Health Insurance that it is difficult to justify (1) a less generous provision for the invalid than for the man in good health whose circumstances certainly involve smaller expenditure, and (2) the existence of two state schemes, side by side, one of which recognises the needs of dependents and the other does not, in circumstances of hardship closely similar. The disparities are attributed to the approved-society system of administration which acts as a buffer between the workers and the Government, absorbing the pressure for more liberal health-insurance benefits. Additional cash benefits are already received by about half the persons insured under the health-insurance scheme, and they tend to look to their societies rather than to Parliament for increases in benefits above the legal minimum.

The societies, the report points out, have no incentive to agitate for increased statutory cash benefits; for many of them, on their private side, do a large business in voluntary health insurance, and increased cash benefits in the compulsory scheme would reduce the need for voluntary insurance. In unemployment insurance, on the other hand, very little voluntary insurance business is done and the workers look to Parliamentary pressure to secure increased benefits. According to this American study of British social insurance, it is here that the factors giving rise to the disparities between the cash benefits of health and unemployment insurance in Great Britain may be found.

1. Unemployment and Health Insurance in Great Britain, 1911–37. By Marianne Sakmann. Washington: U.S. Govt. Printing Office. 1938. Pp. 44. 10 cents.

## Adequate Physic?

In the *News Chronicle* for Jan 18 appears an article by "A panel doctor" entitled "I am sorry for my patients." The writer says that in his experience an insurance practitioner cannot order expensive drugs or several remedies at one time, such as a gargle, a cough mixture and a nasal spray, without a serious risk of being fined for excessive prescribing, and that patients are therefore deprived of necessary treatment. When he first started panel practice he tried to give his patients the treatment which he had been taught to use in hospital, and made full use of proprietary drugs which are prepared for injection. As a result the cost of his prescribing was found to be nearly twice the average for the area. The matter was considered by the panel committee and he was duly mulcted of £10. The writer points out that once a doctor has told his patient that certain drugs are necessary it becomes his duty to provide them irrespective of his liability to be fined. This means

that if a doctor is to protect himself from penalisation he must avoid prescribing expensive drugs lest he be fined for so doing and must also keep his patients in ignorance of the existence and advantages of such drugs lest he be fined for not prescribing them. According to the article this system of administration is calculated to destroy the doctor's enthusiasm and self-respect and the patient's confidence. The panel patient's loss is never known.

The fact is that any panel doctor may order any medicine at any price that is necessary for the proper treatment of his patients. Indeed, it is by no means uncommon for an individual patient to cost as much as £1 a week in drugs and certain cases have involved very much more than that. If ever a doctor's prescribing is questioned—as it must sometimes be since public money is involved—he has only to prove to the satisfaction of a committee of his colleagues that his prescriptions were medically necessary. It is only where extravagance or excess in ordering is proved that the practitioner is penalised. The question which the doctor must consider in prescribing a drug and which may subsequently have to be investigated by the panel committee is not whether the drug ordered is costly, but whether it is unnecessarily costly—that is, whether a preparation of equal therapeutic value could have been ordered at less cost. This criterion applies to proprietary as well as other medicines. No doubt many of the multiple prescriptions which are a frequent cause of trouble are given in response to suggestions of patients themselves, and practitioners should ensure that the treatment they prescribe is based on a knowledge of the principles and practice of modern medicine and not directed by the opinions of the patient.

### The Unprofitable Patient

An insurance practitioner has been called to task by an insurance committee for writing an unwise letter to a patient. He had applied to the committee to have this patient removed from his list. In such a case no reason for the request need be given and the practitioner need only satisfy the committee that the insured person is not incapable of work and not receiving treatment at weekly or shorter intervals. The practitioner also wrote to the patient saying that he found from his records that during the last twelve months the patient had attended at the surgery no less than 44 times, and that the remuneration in respect of this worked out at just over 2½*d.* per consultation. He went on to say that the patient must admit that he had done his best to look after him since he came into the practice and that it was only fair that someone else should now take a turn.

In every practice there must be panel patients who are unprofitable when regarded individually, but on the other hand there are others who seldom if ever require treatment, and practitioners must set off the good cases against the bad. There can be no justification for asking for the removal of a patient who has needed much treatment unless his demands have been unreasonable.

## GRAINS AND SCRUPLES

*Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index*

### FROM AUTOLYCUS

#### I—ALLOTMENTS AND CAREERS

LOOKING out of the carriage window as our train approaches some busy country town we notice amongst the other changes in the scene the appearance of untidy tracts of land, cut up into smallish squares or strips, most of which bear a shabby sentry-box kind of structure and grow an assortment of vegetables and a ragged fringe of old-fashioned country flowers. At this time of year these plots seem to bear little more than some unkempt rows of pea sticks, or that most unsightly of edibles the brussels sprout. These, in short, are the allotments on which the humbler members of the community raise their little crops and practise husbandry. No one would deny that these allotments serve a valuable function, recreative and nutritive, but equally no one can dispute that they lack those grander elements of pastoral beauty through which our train passed before it reached them. In no depreciative sense I am reminded of these allotments when I encounter the series of Grains and Scruples scattered through the well-ordered and majestic literary parklands of THE LANCET. It is clear that their writers have enjoyed writing them, and that their readers have been the better for them. I hasten, therefore, to take possession of the little plot that is mine for a few weeks, without the expectation—and happily without the necessity—of trying to rival the spreading beauty of the literary oaks—and chestnuts—that hem it in on all sides, and I shall proceed to sow my grain without scruples.

Thinking of chestnuts reminds me naturally enough that each year the weekly medical journals issue what is known as an "Educational Number." This has many striking qualities besides impressive bulk, but it would be superfluous for me to describe these since for the modest sum of one shilling any one of my readers may regale himself with this guide to knowledge during the last of the holiday months. But while this number has probably never achieved a "succès fou" as a holiday book, it must be as welcome as the flowers in May to the harassed editor, since with the single exception of one item it is a reprint of every educational number for more years than I care to remember. Now if my grains are to have any scruples I must admit that the last educational issue of THE LANCET made a bold effort, and not an unsuccessful one, to break with tradition, but one swallow doesn't make a summer and it is the tradition that I am now concerned with.

In the traditional educational number this single item I have just referred to, somewhat different though its outward form may seem from year to year, does not place any great strain on the editorial imagination, for beyond a little shuffling of the sentences and a few fresh adjectives it is substantially the same year after year. Of course I refer to the inevitable article on Medicine as a Profession. Now this subject doesn't lend itself greatly to variation or provide any irresistible impulse to original thought, though it is true that the president of the Royal College of Physicians who recently dealt with this topic in an opening address to medical students did find a little new ground to break when he told his

doubtless appreciative hearers to keep their emotions on ice until they were qualified and well launched in professional life. But in more than one sense this must have seemed a chilly counsel and cannot have greatly added to the gaiety of the function.

Nevertheless, even in this well-worn topic of a career in medicine there is a spice of humour, at least in the hands of some of its exponents, and this is what induces me to return to it after a sufficient experience of the practice of medicine to have acquired some heretical notions of my own. Of course all the best notions are heretical.

* * *

As a student I doubt if I ever deliberately thought of building myself a career, and certainly since those far-off days I have noticed that the conscious career builder is too often an unblushing egotist. Yet I do recall a period immediately following the Armistice in 1918 when I was forced to ask myself what I was going to do with my bright young life—as it then was, or seemed to be—when I returned to England. I was in Egypt at the time, and had been there continuously for close upon four years. I had left a resident post to join the R.A.M.C. and therefore had nothing definite to return to. It was in these circumstances that after a guest night in the mess I found myself strolling up and down between the desert and the sea on one of those wondrous moonlight nights that all who served in those parts will recall. My companion was an elderly consultant who had had a great success in his own professional career. He had dined well, was puffing at an indecently large and lethal cigar, and was feeling in an expansive and reminiscent mood. Out of a rich experience he proceeded to give me his advice on this burning topic of a career, and to help me to set about achieving a success comparable with his own, or as near his own as my obviously modest merits entitled me to look for. As far as I can now recall, this was substantially what he had to say. "Now, my boy, I can look back on a singularly successful career"—yes! this was the very word he used—"and I think it's only fair that we old fellows who are going out should pass on to you young ones who are just beginning some sound advice. Now there are three ways you can choose from if you want to get on in consulting practice. You can try to build up a reputation on research. Well, I soon decided against that. The general practitioner—like his patients—distrusts the scientist, and anyway a thirst for knowledge and the bedside manner seldom go well together. In fact, you fall between two stools. I shouldn't attempt it if I were you. Look at so-and-so and so-and-so! You know what they say in the obituary notices of such fellows 'He never obtained that success in practice which his merits entitled him to, but his colleagues appreciated his worth.' Well, that won't help your widow much." I had not acquired the makings of a widow at the time, so this didn't depress me as much as it would now. However, he went on "Then, of course, you can take the social line, keep open house and a good table—it must be a good table—for the people who may help you. But that's very expensive and terribly exhausting, and your wife may go on strike. I don't advise that either. In any case I doubt if you could carry it off." He gave me a penetrating look as he said this, and I began to feel that there was no hope for me; but relief was at hand. "The third way, my boy, and believe me it's easily the best, is to write a text-book. As you know, this is what I did and it made me. My book's gone into five editions, and when I get back I shall have another one on the stocks. It's so simple—industry and a good library for reference, that's all you want. You take my word!"

More followed on these lines. I thanked him with eager deference, expressing that warm and generous gratitude the young invariably feel for the advice of their elders, and when we parted I was resolved to take to scissors and paste and become an eminent medical author as soon as I got back to England.

* * *

The sequel is interesting, but something of an anticlimax, for I returned to London too late. All my contemporaries were busily writing medical masterpieces. After twenty years the spate continues and shows no signs of subsiding. In short, this writing business was no secret at all. There remained for me nothing but the hollow revenge of the soured and disappointed man—namely, to review the books my more successful rivals were publishing. This did indeed compensate me for many reverses, though as a road to popularity I cannot honestly recommend it, while as for prosperity—well, editors would blush with manly pride did I reveal the princely sums they pay away to their reviewers.

* * *

Thus it is that my masterpiece remains unconceived, unborn, and in middle age the birth pangs of medical authorship are likely to be more than I could expect to survive. Still, ambition flickers up feebly and futilely long after all hope of its achievement is dead, and from time to time I coquet basely with the notion of writing a volume of medical memoirs. These seem to have a tremendous vogue nowadays. The public feels that it is being let into spicy secrets of the consulting-room and rushes to read these quaint compounds of fact and imaginative fiction. In somewhat similar mood we may see a group of gaping children, a few blousy housewives, and that prince of idlers the errand boy, standing open-eyed round some door before which an ambulance stands waiting, and through which—if they are lucky—some sufferer with a horrid rash, or with delirium tremens, will shortly be borne. D.T.s. of course, trumps all other diseases in this game. But even a volume of memoirs calls for some gifts, literary if possible, but if these are not forthcoming, then for some kind of strip-tease act in which the author will reveal himself—under some thin disguise—as having had a saucy past and an unrepentant present, the whole sprinkled with platitudes to taste, as the cookery books say. Some studied spirit of benevolence for mankind is also a necessary qualification for successful sales. In short, this kind of author is born, not made. Weighed down by an increasing load of morbid repressions I cannot hope to shine in this literary world. In any case, nothing has ever happened to me that anyone will want to pay half a guinea to read about. But this question of the writing of medical text-books is an interesting one, and I shall return to it.

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"... Lord Rayleigh has lately shown the absurdity of the charge that scientific men are responsible for the evil uses that are sometimes made of their discoveries. But this responsibility is theirs, that they shall explain what they find so that their fellow-men know how they stand. The scientist cannot be expected to see that discovery is rightly used, but no one except himself can rightly describe it. It is not to be expected that the best use will be made of what is imperfectly understood."—Sir WILLIAM BRAGG, P.R.S., *Proc. roy. Soc.* B, 1938, **126**, 263.

# PUBLIC HEALTH

## Influenza and Pneumonia

In the week ending Jan. 21 the deaths in the great towns of England and Wales attributed to influenza numbered 223, or only nine more than the previous week's total. At the same time notifications of primary or influenzal pneumonia showed some decline, from a corrected total of 1804 in the week ending Jan. 14 to 1638, the latter figure being only a little above the level expected at this time of year. The influenza deaths were still largely derived from northern towns, though their number slightly declined in Manchester (from 20 to 15) and in Liverpool (from 25 to 24) and rose in London (from 19 to 26). There is still clearly no evidence in the published figures of the usual rapid spread of "real" influenza from one part of the country to another or of its equally rapid accessions with time, as may be seen from the comparison of the experiences of the last three years given in the accompanying table. Although the level of the present year is substantially above that of 1938 it is far below the order of events in the last epidemic year (1936–37) and the trend of its figures gives reason to hope that its maximum has been reached.

DEATHS FROM INFLUENZA IN THE GREAT TOWNS

| 1936–37 | | 1937–38 | | 1938–39 | |
|---|---|---|---|---|---|
| Week ending— | Deaths | Week ending— | Deaths | Week ending— | Deaths |
| Dec. 5 | 43 | Dec. 4 | 45 | Dec. 3 | 24 |
| „ 12 | 54 | „ 11 | 46 | „ 10 | 26 |
| „ 19 | 57 | „ 18 | 52 | „ 17 | 36 |
| „ 26 | 97 | „ 25 | 46 | „ 24 | 41 |
| Jan. 2 | 325 | Jan. 1 | 59 | „ 31 | 89 |
| „ 9 | 768 | „ 8 | 77 | Jan. 7 | 144 |
| „ 16 | 1100 | „ 15 | 91 | „ 14 | 214 |
| „ 23 | 1137 | „ 22 | 73 | „ 21 | 223 |

### CLINICAL ASPECT

In *Manchester*, our correspondent writes, the epidemic resembles in some respects the one in Liverpool which preceded it by about a fortnight. Although there are variations in the clinical picture, yet the majority conform to the following type. Sudden onset, with the development of marked generalised pains and temperature of 101°–103° F. within two or three hours of normal health. In many cases severe frontal headache and retro-orbital pain have been a marked feature and have caused considerable worry in connexion with the possible development of sinus disease; but the headache has cleared without the development of any sinus or aural complications. Then on the second or third day has appeared the principal incapacitating symptom, a tracheopharyngitis—distressing, harsh, dry cough with substernal pain. The pyrexia on an average has been lasting four or five days and has left marked asthenia and depression, frequently with nausea and emotional instability. The absence of pneumonia, or in fact of any chest signs in the great majority of cases, has been conspicuous. Although in respect of mortality and clinical severity the epidemic has been a mild one, yet it has caused a great deal of incapacity. The distribution is interesting, in that the infectivity in small communities appears to be very high. In institutions it has been noticed that practically every person in one ward has been affected and in another ward there have been no cases. It is difficult to say whether this epidemic is due to the influenza virus or not. Prof. Maitland told me he had not had opportunity of examining more than a few throat washings; these however were negative with one doubtful result. There was no specific antibody response to the influenza virus in the sera tested. In the majority of the sputa examined the predominant organism was a pneumococcus.

In *Devon*, though widespread and highly infective, often running through the house, the disease has been mild in character, most cases showing pyrexia for not more than three or four days with more or less headache, backache and malaise followed by tracheitis. Pulmonary complications have been rare and aural complications more so. Less typically the disease has manifested itself as a catarrhal gastro-enteritis, occasionally with intractable diarrhœa. In some cases there appears to have been a long incubation period, patients having experienced vague malaise and catarrhal symptoms for a week or longer before the disease declared itself in pyrexia. Abortive cases, also, have been noted in which symptoms and pyrexia appeared and disappeared again within a few hours without treatment. Most cases have been fit to resume work in a week or a fortnight. As usual, there have been relatively more cases among the very poor than among any other economic class. The epidemic is now on the wane.

## INFECTIOUS DISEASE

### IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 21, 1939

*Notifications.*—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1821; diphtheria, 1345; enteric fever, 22 (21 "expected"); pneumonia (primary or influenzal), 1638; puerperal pyrexia, 181; cerebro-spinal fever, 38; acute poliomyelitis, 10; acute polioencephalitis, 5; encephalitis lethargica, 8; dysentery, 36; ophthalmia neonatorum, 87. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 27 was 3250, which included: Scarlet fever, 598; diphtheria, 1031 (carriers, 50); measles, 6; whooping-cough, 722; puerperal fever, 19 mothers (plus 13 babies); encephalitis lethargica, 297; poliomyelitis, 5. At St. Margaret's Hospital there were 29 babies (plus 13 mothers) with ophthalmia neonatorum.

*Deaths.*—In 126 great towns, including London, there was no death from smallpox or scarlet fever, 2 (0) from enteric fever, 6 (0) from measles, 20 (5) from whooping-cough, 34 (2) from diphtheria, 52 (14) from diarrhœa and enteritis under two years, and 223 (26) from influenza. The figures in parentheses are those for London itself.

West Ham reported the only 2 deaths from typhoid. Manchester and Newcastle each had 2 deaths from whooping-cough. Fatal cases of diphtheria were scattered over 24 great towns, no more than 2 in any. Of the 223 deaths attributed to influenza 151 were reported from the Northern Area: Liverpool contributing 24, Manchester 15, Salford 10, Sheffield 8, Blackburn and Hull each 7, Preston and Wallasey each 6, Bolton, Carlisle, St. Helens and Warrington each 5; and 19 from the Midland Area: Birmingham contributing 5, Bristol 3.

The number of stillbirths notified during the week was 256 (corresponding to a rate of 39 per thousand total births), including 32 in London.

# LETTERS TO THE EDITOR

## "BETWEEN FRIENDS"

SIR,—I venture to support whole-heartedly your leading article. Some years ago I talked to your predecessor about the possible serious effect of specialism upon such journals as *The Lancet* and the *British Medical Journal*; and in so far as one can expect an editor to show any emotion his reply was "*touché*." It will be a serious matter for the general medical profession and for back-numbers like myself when *The Lancet* cannot promptly tell us the latest efforts in English medicine. If some errors creep into your reports they are certainly not greater than the errors we make ourselves, and they can always be corrected.

One thing I think is certain. The individual doctor cannot afford to subscribe to every specialised journal, nor can many find room for the *Proceedings* of the Royal Society of Medicine. Accordingly every effort should be made to keep established and reputable journals such as *The Lancet* and the *British Medical Journal*, which have a general outlook, supplied with the best and latest information on English medicine. I uphold your view that this is wholly to the advantage of us as doctors, and moreover our right.

I am, Sir, yours faithfully,

Bath, Jan. 27. F. JOHN POYNTON.

## RENAL CHANGES IN MALIGNANT HYPERTENSION

SIR,—Drs. Wilson and Byrom are to be congratulated on the work they reported in your issue of Jan. 21st. To accomplish the delicate operation of partially occluding the renal artery in so small an animal as the rat is a triumph in technique, and their results form a valuable new contribution to the study of vascular disease. It would be a pity however if some of the value were lost through too free an interpretation, and it seems important at this stage to be cautious in drawing conclusions, especially in relation to problems of nephritis. The writers are preoccupied with the idea that essential hypertension causes nephritis. They say that if it could be shown experimentally that the picture of chronic interstitial nephritis may be caused by hypertension alone the concept of malignant hypertension would be strengthened, and one gathers that they regard their experimental results as having done this. It is difficult to share their view. The concept of malignant hypertension is that hypertension leads to arterial lesions which in turn cause progressive renal destruction through ischæmia. The illustrations provided by Drs. Wilson and Byrom undoubtedly show degeneration of renal vessels, but not the picture of chronic interstitial nephritis. In their figs. 3, 5, 7 and 11 there is severe destruction of arterioles and glomeruli, but no more degeneration in the tubules around than may be found in the cortex of any rat dying after a severe toxæmia. Their figs. 9 and 15 it is true show some parenchymatous degeneration, but it is of a type frequently found in rats subjected to dietary disturbances, and which is not dependent on vascular disease. The writers venture to explain the absence of interstitial changes on the ground of the short duration of the experiments. They may be right, but their explanation is speculative and must not be confused with experimental evidence. So far as their experiments go the evidence, as judged by their illustrations, is that vascular disease in the kidney does not necessarily lead to parenchymatous destruction. This can hardly be said to support the concept of malignant hypertension. I am, Sir, yours faithfully,

J. B. DUGUID.

Welsh National School of Medicine, Jan. 28.

## THE AIR-RAID

SIR,—I am following the series of articles under the above heading with intense interest. They deserve the widest possible circulation in both lay and medical circles, for their realistic and practical instruction bears a message for all.

In the instalment of Jan. 21, on general principles of wound surgery and anæsthetics, the authors have, however, allowed themselves to fall into error. I am in entire agreement with them when they advocate closed methods of anæsthesia, avoiding, I am pleased to notice, any reference to intravenous agents, which will have only a limited application in war; but I must cross swords with them on the issue of post-anæsthetic conjunctivitis. Surely they must know that conjunctivitis never follows a "closed" anæsthetic? The conjunctivitis which was seen when the open methods of anæsthesia were in common usage was due to the abrasion of the surface of the orbit with the ether-sodden gauze covering the Bellamy-Gardner mask. Other causes were the occasional introduction of vomit into the eye and the rarer, more serious, and therefore better known accident which resulted from the dropping of liquid chloroform into the eye—the dreaded "chloroform eye." These factors do not exist where gaseous agents are used, as in the "closed" and "semi-closed" methods. Where open methods are used—and presumably they will have to be used under war conditions, when the shortage of specialist anæsthetists will be fully felt—the prevention of conjunctivitis depends on following a rigid technique. Reliance must be placed on the strictest attention to the eyes during the anæsthesia. The administrator must see that they are kept closed throughout the operation and that at no time are they likely to be abraded by the mask or its appendages. It behoves those who are responsible for the instruction of students to teach first principles first and to see that their charges are fully capable of walking with the open and closed methods of ether administration before running with such companions as Pentothal, cyclopropane and divinyl ether.

I had intended also, in this letter, to draw attention to the evil of pouring castor oil into the eye "to diminish the risk of post-anæsthetic conjunctivitis." I had always been led to believe that this agent, when exposed to the air on anæsthetic wagons, was an excellent culture medium for bacteria, more likely to cause conjunctivitis than diminish it. Before committing this opinion to paper, however, I thought it better to put it to the test of experimental proof. My colleague Dr. W. E. M. Armstrong, to whom I am very much obliged, kindly cultured an antique sample of castor oil at the Central London Ophthalmic Hospital for me and found it to be sterile. He tells me however that castor oil which is kept for any length of time will cause considerable discomfort in the eye because it contains decomposition products. Whilst absolving castor oil from the charge of actually infecting the eye, it still, on this account, lies condemned and should be banished from the anæsthetic

wagon. Liquid paraffin is to be preferred where an oily instillation is indicated.

In conclusion I would deprecate the advocacy by your distinguished correspondents of the tongue-clip. This barbarous weapon should long have been abolished from the armamentarium of the anæsthetist.

I am, Sir, yours faithfully,

Harley Street, W.1, Jan. 28. L. H. LERMAN.

## X-RAY THERAPY FOR TOXIC GOITRE

SIR,—I note with much interest the remarks, in your last issue (p. 235), of Drs. Poulton and Watt as I have had experience of such cases over the past twenty years. I agree that our present results are extremely good and at least 75 per cent. "cures" should be obtained with the accurate and standardised treatment that was not possible in the earlier days. In my opinion so-called "deep X rays" are not required; I use 150 kV with 2 mm. Al. filtration and a dosage of 700 r. I have not found iodine medication necessary during treatment.

I am, Sir, yours faithfully,

WARNER COLLINS.

Putney, London, S.W.15, Jan. 27.

## CLINICAL USE OF STILBŒSTROL

SIR,—I have read with great interest the report on the œstrogenic properties of stilbœstrol contributed to your issue of Jan. 7 by Drs. Bishop, Boycott, and Zuckerman. Recently I have studied the effects of this synthetic œstrogen on menopausal symptoms in 18 castrated women. The œstrogenic properties of stilbœstrol are beyond any doubt though I think that, when orally administered, it is three or four times less active than œstradiol benzoate subcutaneously injected at the same dosage.

But I do not agree with Dr. Bishop and his associates about the toxicity of this drug. Among 46 patients they observed only 3 cases of transitory intolerance. I am somewhat less enthusiastic. All my patients have received stilbœstrol by mouth. In four cases the immediate reactions were very severe. After the absorption of doses so small as 0·3, 1, 2 and 3 mg. during two or three days, the patients experienced severe nausea and continuous vomiting, rapidly followed by a complete gastric intolerance, as long as stilbœstrol ingestion was continued. In these cases the treatment was accordingly stopped. In four other cases similar symptoms appeared later, after a continuous absorption of six weeks' duration, involving total doses of 43, 53, 95 and 165 mg. Three other patients experienced slight and transitory nausea and epigastric pains after the ingestion of 46 mg. (in one month), 88 mg. (in one month) and 102 mg. (in two months). The remaining patients have tolerated stilbœstrol quite well; but only two of them have had the treatment for more then six weeks.

Considering that this treatment of menopausal symptoms is one of substitution and must be continued over a very long period, I personally hesitate to employ it further; for its innocuousness does not seem to me sufficiently demonstrated. I have never observed such an intolerance after or during the use of œstradiol benzoate or testosterone propionate for the relief of menopausal symptoms and I see no reason in replacing these drugs by stilbœstrol, which is less efficient and certainly toxic.

I am, Sir, yours faithfully,

Paris, Jan. 28. J. VARANGOT.

## SURGERY IN ULCERATIVE COLITIS

SIR,—Mr. Lockhart-Mummery has rightly stressed the need for differentiating between the degrees of severity of ulcerative colitis. The milder cases often respond well to medical treatment or appendicostomy. The bigger problem is the treatment of the bad cases, and particularly of those of the progressively fulminating type which rapidly go downhill and terminate fatally. It is in this last type that surgery is especially indicated.

Appendicostomy has proved profoundly unsatisfactory in the severe case. Rest to an inflamed part is one of the primary maxims of surgery, and to secure this such operations as colostomy and cæcostomy came into vogue. The objection to cæcostomy is that it does not secure complete rest to the bowel, which is essential. If the object is to relieve distension and procure irrigation, this can be more satisfactorily accomplished by appendicostomy. Colostomy, whilst admirable in procuring rest to the bowel, has a limited applicability, for only rarely in the more severe cases is the distal segment of the colon only affected. Dr. Gaha's treatment of ileosigmoidostomy and colostomy can only be applicable to the mild types. Anyone familiar, either at operation or post mortem, with the severe types knows that the friable, indurated and congested bowel precludes any form of anastomosis, the sigmoid colon and upper rectum often being involved. To procure the desired rest of the inflamed bowel a transverse ileostomy must be performed, and this treatment has been advocated by Mr. W. H. Ogilvie (*Brit. med. J.* 1938, **1**, 1197). The following case is of interest with this in mind.

A girl aged 22 was admitted to the Royal Victoria and West Hants Hospital under Dr. Watson Smith with ulcerative colitis. Five weeks before admission she experienced colicky pains chiefly in the left side of the abdomen. The pains were aggravated by food and somewhat relieved by defæcation. A week later she was suddenly seized with diarrhœa and began to pass 8–12 motions a day. The stools were normal in colour, they contained streaks of blood but no mucus and were very offensive. She improved slightly with bismuth and opium mixtures and dieting. Shortly before admission she began to get attacks of vomiting and nausea, and her stools now contained chiefly blood and mucus. She had lost 1½ st. in five weeks. On admission her temperature was 102° F., pulse-rate 112 and she was pale and looked ill. The abdomen was slightly distended and tender all over, especially over her splenic and descending colon. Rectal examination with a speculum showed ulceration, and caused the passage of blood and mucus.

Agglutination tests were negative for the typhoid and paratyphoid groups, the food-poisoning bacilli, *Br. abortus* and *melitensis*, *B. dysenteriæ*, Flexner V. W. Y. Z. and Sonne; positive for Shiga's bacillus 1 in 25 and *B. Newcastle* 1 in 50. This was suggestive of a Shiga infection. Culture of stools gave a profuse growth of *Streptococcus fæcalis*, some hæmolytic streptococci and a fair growth of *B. pyocyaneus*. Blood-count: 3,600,000 red cells, hæmoglobin 46 per cent., leucocytes 12,000, polymorphs 78 per cent.

The patient was treated medically for a further three weeks. Large doses of antidysenteric sera given daily; Albargin washouts, Yatren injections. During this time she was going rapidly downhill. When I was asked to see her she was very toxic and ill. Her temperature was swinging between 100°–103° F., pulse-rate 120. Under local anæsthetic I did an ileostomy with a spur. The whole of the colon from cæcum to rectum appeared to be involved. The patient's condition was critical but was improved with a blood transfusion. Within

two days of the establishment of the ileostomy her temperature dropped to normal and remained so, her pulse slowed and her general condition, which was previously moribund, improved. The number of stools passed per rectum immediately started to decrease, and ten days after the establishment of the ileostomy she was passing nothing per rectum. The ileostomy was then working regularly about twice a day and was perfectly easy to manage. She suffered from severe anorexia and nausea, and it was with the greatest difficulty she could be persuaded to eat. Unfortunately she collapsed and died some five weeks after operation through sheer inanition.

In your leading article of Jan. 21 it is advocated that medical treatment should be tried for three to four weeks. The severe case when seen by a surgeon at this stage is almost moribund and past effectual aid. I suggest that if after a week or ten days' intensive medical treatment no improvement is achieved surgery should be contemplated. The only effective surgery is to set the bowel completely at rest by a transverse ileostomy. In the above case ileostomy produced an obvious improvement straight away by lessening the toxæmia, bringing the pulse-rate and temperature down to normal and reducing the number of stools to none. Often the patients' strength is so sapped by strict dieting that they have no resistance to combat their toxæmia. The lack of appetite may be due to an achlorhydria from which many of them suffer. An early ileostomy would enable them to have a full and free diet without fear of affecting the inflamed bowel.

I am, Sir, yours faithfully,

Bournemouth, Jan. 29. C. E. P. MARKBY.

## CONTROL OF DIPHTHERIA

SIR,—I see from E. H. R. Harries's review of diphtheria (pp. 45–48) in your issue for Jan. 7 that the diagram showing diphtheria in the staff of the Birmingham City Hospital is actually said to show the effect of immunising the staff against diphtheria. This diagram shows that the highest number of cases of diphtheria in the staff was reported in the year 1920, and that there was a striking drop in diphtheria in 1921 and 1922. In the latter year the Schick test was introduced. Immunisation was not started until 1923. The curve showing decline of diphtheria from 1922 is not nearly so acute as from 1920–22. At the time the Schick test was introduced the diphtheria rate had dropped below its lowest rate since 1916. Surely we may conclude that whatever caused the drop in diphtheria from 1922 was at work prior to that date. Moreover, it cannot be contended that the mere introduction of the Schick test could reduce the diphtheria amongst nurses. It would be interesting to know the number of nurses with tonsillitis and a positive swab but negative Schick reaction during these years.

Dr. Harries maintains that the reduction of clinical diphtheria in the residential schools of the L.C.C. is due to the inoculation of the children. There must, however, in all these homes be a proportion of the children in whom the advocates of the system would contend that immunity had not developed. On the Continent it is believed that immunity develops within a month of either one or two injections. Here few advocates of the system allow less than three months for immunity to develop after the final injection, and those that are still Schick-positive are said to require further injections. There must thus always be a period of (say) four months from the entry of the child into the home before it can be considered to be immune by the standard of the immunisers. Dr. Newsholme showed that in the Birmingham institutions, over a period of ten years, there were some 2000 non-immune children residing in them for periods up to six months from entry, yet amongst these children only three cases of diphtheria had been reported, although they were subject to the ordinary risks of that disease. If the unimmunised children in these institutions are so free from diphtheria, why should the freedom of the immunised be attributed to the inoculation?

I am, Sir, yours faithfully,

Bonner Road, E.2, Jan. 12. M. BEDDOW BAYLY.

*** We have referred this letter to Dr. Harries, who replies: "I have to thank you for the opportunity you have given me of seeing Dr. Beddow Bayly's letter. He says that it cannot be contended that the mere introduction of the Schick test could reduce the diphtheria among nurses. It is not so contended and never has been. I agree that the diagram he mentions merely indicates the date of introduction of the Schick test, but if Dr. Bayly will refer to the paper indicated in the legend below the diagram (*Lancet*, 1930, **1**, 802) upon which the diagram itself is founded, he will find the following statement (*italics mine*):

> Schick testing of the nursing staff commenced in January, 1922. *From then onwards only nurses who were Schick-negative reactors have been allowed to work in diphtheria wards;* but it should be stated that active immunisation of the positive reactors [i.e., of those excluded from the diphtheria wards] was not commenced until the last quarter of 1923. . . . From the beginning of 1925 onwards a similar procedure was adopted for the domestic staff also, *since when no nurse or maid has been allowed to work in a diphtheria ward until known to be Schick negative.* . . . No Schick-negative reactor [i.e., until the end of 1929—9 years ago] has contracted clinical diphtheria.

Needless to say, in a hospital of this kind diphtheria means diphtheria, and not any other disease.

"With regard to the fall in the incidence of diphtheria among the staff I may again quote from the 1930 *Lancet* article: 'The results in the earliest years have been submitted to statistical analysis by Hilda M. Woods' (*J. Hyg., Camb.* 1928, **28**, 147). She showed that during 1919–21 the attack-rate was 17·8 among an average nursing staff of 90; during 1922–24 it was 3·7 among an average nursing staff of 108: a difference between the attack-rates for the two periods of more than four times the probable error—'a greater difference than would be expected as the result of chance alone.'"

## EFFECT OF WAR ON CIVILIAN POPULATIONS

SIR,—I have read with interest and enlightenment Dr. Maurice Wright's address published in your last issue. It was my privilege to serve as a regimental medical officer for nearly three years in the line in France and I think that any regimental medical officer would disagree with one or two of the generalisations made by Dr. Wright in this address as purely hearsay evidence. Dr. Wright states: "I am afraid it is a fact that many more will expose themselves to danger to save property than to save another life." My own experiences in the last war entirely refute this statement. It was a daily experience for men to lay down their lives for others and volunteers were never lacking for any heroic enterprise.

Again Dr. Wright says that "under terrific bombardment whole battalions succumbed to panic and ran back." I do not know whether or not he was referring to British battalions, but if so such a statement is entirely mythical. For over and over again one saw battalions not retreating but advancing

"under terrific bombardment." If these battalions had done otherwise Dr. Wright and I would not be in the enjoyment of such security as we at present have. Dr. Wright wonders if "the return of some religious belief may not prove to be for many people one of the best defences against anxiety." It will be admitted that the true Christian is practically without fear. St. Augustine after his conversion stated: "All my memories are now free from dread." Many of us hold that psychology fails when it is not accompanied by religious synthesis. Can anyone be "harmonised" if the harmony is not physical, mental and spiritual? It should be recognised by psychologists that if spiritual harmony is achieved, mental harmony will follow in its train.

I am, Sir, yours faithfully,

W. ANNANDALE TROUP

Wimpole Street, W.1, Jan. 30.

## PLACENTAL BLOOD FOR TRANSFUSION

SIR,—Your last issue contains two papers, by Page, Seager and Ward and by Halbrecht, to certain points in which we feel we must draw attention. On Jan. 21 you were good enough to publish an article by ourselves on this subject. Our conclusions, which dealt with the three primary issues of quantity, sterility, and the feasibility of collection by the ordinary personnel of the labour ward, when compared seriatim with those of the above articles, emphasise clearly the following points:—

1. The question of *quantity*. The three English publications give a maximum of 80 c.cm. with a minimum of 47 c.cm., as opposed to the American figures of 125 c.cm. (Goodall) and 105 c.cm. (Grodberg)—a substantial reduction. Let it be remembered, however, that our figure of 47 c.cm. is the strict mean of fifty consecutive cases with no selection whatever. We would like to ask Drs. Page, Seager and Ward, and Dr. Halbrecht, if they chose their source of supply with the same strict impartiality. Quite apart from this point, the English placenta, compared with its American cousin, seems to be only capable of producing an average yield of between 50 and 80 c.cm.; does such a quantity of blood warrant the trouble of collection and the elaborate precautions that we feel essential for its safe employment in transfusions?

2. With regard to *sterility*. In the first place we would draw attention to the fact that neither Drs. Page, Seager and Ward, nor Dr. Halbrecht, cultured their samples in every instance. The former refer to the culture of 15 samples with 1 contamination, followed by a further 5 with 3 contaminations, which (and this is relevant) occurred on changing the personnel of their blood-collecting team—i.e., a total contamination percentage of 20. The latter reports a contamination ratio of 4 in 48, and appends the following startling statement: ". . . No doubt the same proportion of our placental bloods transfused were contaminated but they produced no harmful effects on the recipients." Dr. Halbrecht, however, admits 4 reactions in 116 transfusions, 3 rigors and 1 of dyspnœa and tachycardia, which to our minds is significant.

We are therefore faced with the fact that Dr. Halbrecht sponsors the deliberate introduction of living and possibly pathogenic organisms into the blood-stream of a patient, a procedure which the whole profession must condemn as indefensible. It disobeys the fundamental principles of asepsis and although up to the present moment the only untoward result may have been a rigor or two, sooner or later serious harm, and maybe a fatality, will occur. If fœtal blood can be contaminated with *Staphylococcus aureus* (Halbrecht) it can similarly be contaminated with the hæmolytic streptococcus. Moreover, if we are to accept the dangerous hypothesis that the defence mechanism of the human body is capable of looking after such contaminants as may admittedly be present in placental blood, there still remains the patient whose resistance is so lowered by hæmorrhage or sepsis (and after all these are the very patients who are likely to be transfused) as to be less capable, or even incapable, of dealing with organisms introduced intravenously. For this reason we cannot state too strongly that if placental blood is to be used for transfusions it must, in every instance, be cultured.

3. The last point to which we would draw attention is the feasibility of the collection of placental blood by the ordinary personnel of the labour ward. Drs. Page, Seager and Ward refer to "the personnel of the blood-collecting team." May we ask the number and status of the members of this team? In our communication of Jan. 21 we pointed out that to get good results in the collection of the blood a special team would be necessary. These authors seem to have realised this and it is indeed significant that their contamination ratio was greatly increased when the personnel of the collecting team was changed.

It is easier to destroy than to create and doubtless we shall be criticised for our destructive attitude towards placental blood. To save misunderstanding may we recapitulate our arguments. The quantity is disappointingly small; if this small quantity is worth using at all it must be cultured before use; and if the quantity and the sterility of the blood-cultures are to be improved a special placental-blood collecting team is necessary. We feel that judged by these criteria the placenta is unlikely to rival the ordinary donor as a source of blood for transfusion.

We are, Sir, yours faithfully,

H. F. BREWER,
JOHN HOWKINS.

St. Bartholomew's Hospital, London, E.C.1, Jan. 31.

## A MEDICAL UNIT IN SPAIN

SIR,—Members of the medical profession are unwearied in their efforts to relieve human suffering, and for this reason I appeal to them on behalf of the Spanish war victims who have endured their prolonged and appalling sufferings with such fortitude.

The Equipo Anglo-Español is a mobile hospital in Nationalist Spain and is the only British medical unit in that country. It has worked close to the front line throughout the bitter fighting of the past two years, and is now in Catalonia. Eight of the staff were recently decorated with the Cross of Military Merit for their bravery. Some 14,000 sick and wounded have passed through the hospital, and whether Nationalists or Republicans, all are treated with the same care.

This hospital in the danger zone has saved innumerable lives and alleviated untold suffering; but instruments and equipment wear out with use, and the need for medical stores increases as the toll of war becomes greater. We earnestly appeal to your readers to send us gifts of new and second-hand instruments, or donations with which we can buy those most needed. All donations in money or in kind should be sent to the Bishop's Committee for Spanish Distress, 38, Eccleston Square, London, S.W.1, and will be most gratefully acknowledged.

I am, Sir, yours faithfully,

CECIL PEREIRA,
Chairman of Executive Committee, Bishops' Committee for the Relief of Spanish Distress.

Jan. 31.

". . . A 'nation' is a society united by a common error as to its origin and a common dislike and contempt for its neighbours."—The Very Rev. W. R. INGE, *Evening Standard*, Jan. 26, 1939, p. 7.

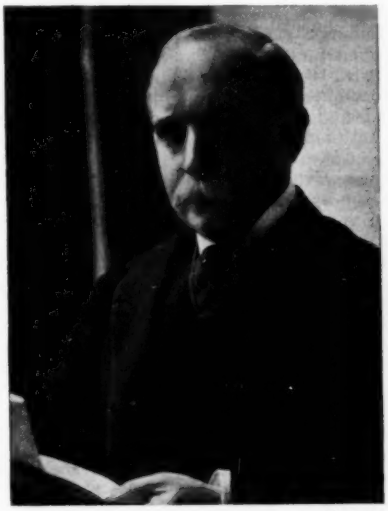
# OBITUARY

## SIR ROBERT PHILIP

M.D. EDIN., F.R.C.P., F.R.S.E.

Sir Robert Philip, professor of tuberculosis in the University of Edinburgh and until lately chairman of the council of the National Association for the Prevention of Tuberculosis, died in Edinburgh on Jan. 25 at the age of 81. He was the first to translate the discoveries of Koch and Villemin and the teachings of Bodington, Brehmer and the other early advocates of fresh-air into a coördinated system for the treatment of all forms and stages of tuberculosis. The "Edinburgh system" that he introduced has now been incorporated in anti-tuberculosis measures throughout the world.

Robert William Philip was the son of the Rev. George Philip of Glasgow. He was educated at Edinburgh High School and Edinburgh University, taking his M.B. with honours in 1882. In 1887 he won the university gold medal for his M.D. thesis on the ætiology of phthisis, and in the same year he took charge of the new Victoria Dispensary for Consumption and Diseases of the Chest in Bank Street, Edinburgh. This dispensary marked the first organised attempt to detect tuberculosis in its earliest stages and to check its spread by educating patients and contacts in preventive measures. Philip came at an opportune time. The medical world was just beginning to discard the hereditary theory and to realise the true ætiology of the disease. Sanatoria had been opened in Germany and elsewhere, and chest hospitals were springing up everywhere, so that in treatment also doctors were beginning to see light. It required someone who, like Philip, combined organising ability with a clear grasp of essential principles, to make full use of the new knowledge. The "Edinburgh system" gradually expanded. In 1894 the Royal Victoria Hospital was opened, in 1910 came the farm colony, and by 1913 the departmental committee on tuberculosis was able to describe the full system as consisting of a dispensary, sanatorium, farm colony, tuberculosis school and hospital for advanced cases. In 1916 the organisation was taken over by the "Tuberculosis Trust" with Philip as adviser, and in 1917, when a chair of tuberculosis was provided in Edinburgh University, Philip was the obvious choice for the first professor. From its foundation in 1899 Philip was a member of the council of the Association for the Prevention of Tuberculosis, and in 1932 he became its chairman. For fourteen years he was curator of the research laboratory of the Royal College of Physicians of Edinburgh, and in 1918 he was president of the College. He had also been president of the British Medical Association, the Association of Physicians of Great Britain and Ireland, the Tuberculosis Societies of Great Britain and of Scotland and the Medico-Chirurgical Society of Edinburgh. He received a knighthood in 1913, honorary degrees were conferred on him by the Universities of Glasgow and Wales and he had received a multitude of distinctions from universities and other bodies abroad. He was the author of many articles in the medical journals and textbooks, and published a volume of collected papers which includes an account of his early work in 1937.



[Lafayette

"Sufficient notice has never been taken of Sir Robert Philip's great teaching gifts," writes Dr. A. Fergus Hewat. "Those of us who had the good fortune of close working association know how much sound teaching he gave to Edinburgh students and graduates during the past forty years or more. It is pleasant to recall the small extra-mural voluntary classes held in the Royal Victoria Dispensary in the early years of the century. My first visit to the Royal Victoria Hospital was as a student in 1906. It was on a Sunday morning, and a perfect clinical demonstration was given of the essential features of the open-air cure. The executive centre in Edinburgh, from which this treatment was carried out, was an Adam house in what were then the outskirts of the city, and in front of it was a circle of open-air shelters for patients. Out of such small beginnings developed the great organisation of the Tuberculosis Trust. Philip's clarity of vision and singleness of purpose were an inspiration to all his colleagues. Meticulous in detail and unflurried in face of unexpected happenings, he never spared himself, and he expected an equally high standard of effort from his assistants. As a general physician in the wards of the Royal Infirmary he showed his sterling qualities as a clinical lecturer, and we marvelled at his ability to find time, amidst all his specialised work, to carry on the duties of a chief for his full term of fifteen years.

"Philip had the great gift of a clear business head, and no-one was more competent to conduct a medical meeting. His masterly handling of the preparations for the meeting of the British Medical Association in Edinburgh in 1927 was an education in business methods, and the success of the meeting was largely due to his inspiration and arduous work. No detail was too small for his notice; and inexperienced but ardent secretaries soon learned that time was gained, not lost, by referring even what seemed unimportant points to the president-elect. He was a great advocate of orderly procedure, and nothing offended him more than looseness of thought and lack of precision in detail. He was punctilious to a fault in his attendance at his university classes: many a nine o'clock lecture he delivered after a night journey from London, and this long after he had reached the age of seventy. He was a strict disciplinarian. At times his assistants became downhearted when their efforts seemed to give little or no satisfaction; but they well knew that he upheld them loyally and energetically when their progress was at stake, and many must now bless his whole-hearted support. Many who had the privilege of meeting Sir Robert in his own home will remember his gracious hospitality. He never

spared himself in entertaining medical visitors to Edinburgh from any part of the Empire or from foreign countries. Like many arduous workers, he appreciated the value of holidays, most of which he spent abroad, usually at his beloved Pontresina. He practised on holiday what he preached—the simple life in the freshest of pure air."

Sir Robert Philip married twice. His first wife, who died in 1937, was Elizabeth, the daughter of John Fenton Motherwell of co. Sligo. Last year he married Edith, daughter of Joseph M'Gaw of New South Wales. He had no children.

Dr. Halliday Sutherland writes:

The death of Sir Robert Philip, my friend and teacher, marks the end of an epoch in the history of tuberculosis, an epoch which began with the discovery of the bacillus of Koch in 1882. For at least a decade after that discovery many distinguished physicians maintained that the tubercle bacillus was not the cause but merely a harmless concomitant of the disease. Yet a young Edinburgh graduate, R. W. Philip, went to Berlin, studied under Koch, and in 1883 returned to Edinburgh with the intention of devoting special attention to tuberculosis. On hearing this the professor of medicine at Edinburgh remarked, "Don't think of such a thing. Phthisis is worn to a thin thread. The subject is exhausted."

None of us know the power of conservatism and inertia until we have experienced opposition to our plans, but today it is difficult and yet encouraging to realise that those of Philip's ideas, which are now accepted as a matter of course, were generally opposed when first mooted. In 1887 at Lauriston Place, Edinburgh, he founded the first tuberculosis dispensary in the world, because he recognised that for every diagnosed case of open tuberculosis there must be many clinically infected contacts who could only be discovered by routine examination in a "march-past" at the patient's home. His plan was opposed by the hospitals, though no-one would now contend that this work could be done in a general outpatients' department. Not until 1890 did Calmette establish a similar dispensary at Lille, and not until 1909 was the first tuberculosis dispensary opened in London—by the charitable enterprise of Miss Edith M'Gaw, now Sir Robert's widow.

The same fate attended Philip's proposal that tuberculosis should be added to the list of notifiable diseases. At a meeting of the Edinburgh Health Society in 1890, in the course of a lecture on consumption, he said, "Tonight I should press strongly for the inclusion of consumptive cases in such compulsory returns." This suggestion was opposed by most doctors, but sixteen years later on March 10, 1906, the Local Government Board for Scotland announced that "pulmonary phthisis is an infectious disease within the meaning of the Public Health (Scotland) Act of 1897."

From his experience at the dispensary, Philip realised the protean nature of tuberculosis and the need of various coördinate institutions to deal with different types of cases; and so around the dispensary there grew the sanatorium, the farm colony, the open-air school and the hospital for advanced cases. The Edinburgh System spread throughout the world, and in 1911 "The Control and Eradication of Tuberculosis: a Series of International Studies" written by thirty-two of his pupils and friends in the Empire, Europe and America, testified to the results of this well-directed coördinated campaign.

In clinical medicine his contributions to present knowledge have been as great as in public health. To him more than to any other do we owe the passing of the old conception of pulmonary tuberculosis as a localised disease called phthisis, and the advent of the modern conception of tuberculosis as a systemic infection with visceral lesions which may occur in any part of the body. Of tuberculin he said "there has grown and remained with me the conviction, which is ever ripening, that in tuberculin we have a remedy of first importance in the treatment of tuberculosis. The cases treated have been very numerous, and of varying kinds and types. The net result, is a decisive verdict in favour of tuberculin." Those words were spoken thirty years ago, but the value of tuberculin in diagnosis and in treatment has not yet been generally recognised.

Sir Robert Philip had the satisfaction, denied to many a pioneer, of seeing his ideas adopted throughout the world during his lifetime. The prophet in this case was not without honour in his own country, but it is right to add that he was more honoured abroad. By his personality and enthusiasm he had the gift of attracting around him younger workers whose services to the "cause" and loyalty to himself gave him great pleasure. In 1913 he was knighted, and this I think, in view of the world-wide and enduring significance of his work, was the minimum recognition that could have been made for his services to medicine.

Sir Robert died at the age of 81, his faculties unimpaired to the last, and although ordered complete rest by his doctors he sent me on Jan. 5 a letter as typically "Philipian" as any that his old pupils rejoiced to receive. He was a scholar of wide culture in literature, of great charm in manner, a good linguist, an ideal host, a loyal friend, and I hold memories of many happy days and evenings in his company in Edinburgh, London, Paris and Rome. I shall close with a reminiscence that recalls his kindness to patients. This happened in 1910 when I became resident physician at the Royal Victoria Hospital, Edinburgh.

In handing over the cases my predecessor, Aubrey Hewat, entreated me about one: "She's a lovely kid. Of course, she's rather far advanced, but if the Chief suggests sending her out, try to keep her. Matron will back you up."

At the end of a week Dr. Philip mentioned the case, and slowly shook his head. "She's been here a long time and is not doing well. The sanatorium is for curable cases, and there is accommodation at Colinton for the more advanced cases."

"I thought she was a little better this week, sir, and it would break her heart to leave."

"It is curious that your predecessor said almost the same thing six months ago. Is she a legacy passed from one resident to another? Not that I do not appreciate these feelings, but—well, let us see what we can do for her."

*Ave atque vale.*

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PROF. VALDEMAR BIE died suddenly on Jan. 2 at the age of 66. As director of the Blegdam's Fever Hospital in Denmark he attracted much attention at home and abroad by advocating massive dosage of antitoxin in the treatment of diphtheria. He also made important contributions to the study of pernicious anæmia, tuberculosis and nephritis. He was editor of *Ugeskrift for Laeger* for many years, and also of certain important works of reference.

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ST. GEORGE'S HOSPITAL, LONDON.—Fifty sets of plans for the new building of St. George's Hospital have been submitted to the assessors, and the award is expected in a few weeks' time. The plans will later be exhibited, not only at a private view, but also to the general public at a small charge.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

### STATISTICS OF NATIONAL HEALTH INSURANCE

IN a paper read before the Statistical and Social Inquiry Society of Ireland on Jan. 27, Mr. R. Ó Brolcháin, an official of the National Health Insurance Society, gave the results of a study of the statistics of that society for the year 1935. It is the first study of figures relating to national health insurance which has been published in Ireland. Mr. Ó Brolcháin pointed out the limitations which must be kept in mind as regards the accuracy of the materials on which the statistics were based. The national health insurance scheme in Ireland is unique in that it does not provide any medical attendance for insured persons. It is a system for the payment of cash benefits only, the entitlement to benefit being incapability for work by reason of some specific disease or bodily or mental disablement. The usual evidence of incapacity supplied is a medical certificate signed by the member's medical attendant. It is clear, therefore, that the precise diagnosis of the cause of the incapacity is not of essential importance in the filling of the medical certificate, and the diagnosis is usually provisional. It was these certificates which provided Mr. Ó Brolcháin's material, and caution is necessary in regarding conclusions based thereon as accurately representing the incidence of the several diseases among the members of the society. Allowing for this degree of uncertainty, nevertheless Mr. Ó Brolcháin's deductions are informative.

In the year 1935 there were approximately 500,000 insured persons in the area of the Irish Free State. Of these 335,409 were men, 31,322 were single women and 5945 married women. The average duration of claim was almost identical among men and single women, but nearly 50 per cent. higher in married women. The number of claims made showed greater variation, being during the year 17·78 per 100 insured men, 22·85 for single women, and 44·23 for married women. No explanation has been found for this high incidence of illness among married women. The incidence of the several diseases at different age-periods is much what might have been expected. "Rheumatism" stands high as a cause of incapacity, with a notable increase after middle life. In the early years of insured life (age 16–20) microbic fevers (principally catarrh and influenza) take first place among men; in the next age-group tuberculosis takes first place and remains the principal cause of incapacity among men up to the age of 40. On the other hand cardiac disease is a relatively rare cause of incapacity until the age of 40 is passed. Among women at all ages from 16 to 60 "anæmia" holds one of the highest places as a certified cause of incapacity. This is in itself remarkable in view of the relative disappearance of chlorosis in the last thirty years.

Mr. Ó Brolcháin notices a certain degree of correlation between the death-rates in certain areas and the incidence of incapacity. The counties with a favourable record are the counties of Dublin and Kildare and the counties along the western coast from Donegal to Kerry, while the eastern coast counties and the midlands have unfavourable records. He adds some information bearing on the occupational incidence of certain diseases. Anæmia has a high incidence among domestic servants; agricultural labourers are specially liable to rheumatism and heart disease; railway workers are more liable to microbic diseases (catarrhal) than any other class of workers, but are remarkably free from tuberculosis. Road transport workers appear to be specially subject to digestive disorders, an observation which has been made also in other countries. Commercial and clerical workers are prone to mental disease and tuberculosis, but relatively free from heart disease and rheumatism.

Mr. Ó Brolcháin's study is pioneer work as far as Ireland is concerned, and it is satisfactory to see that officers of the National Health Insurance Society are devoting themselves to fundamental investigations of such a kind.

## SWITZERLAND

(FROM OUR OWN CORRESPONDENT)

### A DIETETIC PIONEER

Dr. Max Bircher-Benner, who died in Zürich on Jan. 23 at the age of 71, was born in the town of Aarau and sprang from an old stock of Aargovian farmers. Despite great economic difficulties he studied medicine at Zürich and Berlin and after qualification became a general practitioner in Zürich. He soon began to be interested in problems of nutrition, and his own speedy recovery from jaundice on a diet of fresh apples led to his advocacy of a diet in which fresh fruit played a great part. He was convinced that cooking deprived vegetables and fruit of their most valuable constituents, but here he came into opposition with the theories generally accepted in the late 'nineties. He remained firm in his convictions in spite of criticism.

Much that Bircher-Benner said and did thirty or forty years ago has become common-place in the dietetics of today, and the discovery of vitamins has placed his therapeutics on a firm theoretical basis. His private clinic in Zürich, to which he gave the name of "Lebendige Kraft" (living force) drew patients from all over the world to seek recovery by vegetarianism. Dr. Bircher-Benner was himself an excellent cook and designed most of the vegetarian meals which are now served in continental restaurants. Lecture tours and his periodical "Der Wendepunkt im Leben und im Leiden" spread his gospel widely. Both in his speech and his writings he proved himself a sound psychologist with a deep understanding of humanity.

# PARLIAMENT

## NOTES ON CURRENT TOPICS

### Reassembly after Christmas Recess

THE House of Commons reassembled on Tuesday, Jan. 31, after the Christmas recess. The House of Lords will resume its sitting on Tuesday, Feb. 7.

## QUESTION TIME

TUESDAY, JAN. 31

### Government and Milk Legislation

Mr. THOMAS WILLIAMS asked the Minister of Agriculture when it was proposed to proceed with the Milk Industry Bill.—Mr. RAMSBOTHAM (Minister of Pensions) replied: The Milk Industry Bill is being withdrawn, and new legislation will be introduced in due course, details of which it is not yet possible to announce.

### Radium Trust and Commission Charter

Sir FRANCIS FREMANTLE asked the Minister of Health if he would state his proposals for the revision of the royal charter of the Radium Trust and Commission in respect of their powers and personnel.—Mr. ELLIOT replied: I am not yet in a position to make a statement on this matter, but I will communicate with my hon. and gallant friend as soon as possible.

# MEDICAL NEWS

## University of Oxford

Prof. G. R. Girdlestone has offered his resignation as Nuffield professor of orthopædic surgery to the hebdomadal council and the Nuffield Committee. It is understood that he feels unable to devote as much time as he would wish to the duties of the chair.

The Rockefeller Foundation has offered to give £600 in 1939 for scientific apparatus, laboratory supplies, and technical assistance to the department of pharmacology, and for current expenses of investigations on the hormones and on the central nervous system.

## Royal College of Physicians of London

At a meeting of the college held on Jan. 26, with Dr. Robert Hutchison, the president, in the chair, Sir Arthur Hall was elected to represent the college on the court of governors of Sheffield University, Dr. H. C. Cameron on the Child Guidance Council, and Dr. F. G. Chandler and Dr. Geoffrey Marshall on the consultants' board of the British Medical Association.

The following candidates having satisfied the censors' board were admitted members of the college :—

Hassan Radwan Ahmed Abu-Khatwa, M.D. Cairo, Beryl Emily Barsby, M.B. Lond., Geoffrey Walter Boden, L.R.C.P., John Hilary Cobb, M.B. Lond., John Wenman Crofton, M.B. Camb., Helen Easdale Dimsdale, M.B. Camb., L.R.C.P., Hassan Moustfa Seif El Nasr, M.B. Cairo, John Duncan Hay, M.D. Lpool, M.B. Camb., Surg.-Lieut. John Morley Holford, R.N., L.R.C.P., William Murray Honeyman, M.B. St. And., Richard Francis Jarrett, M.B. Camb., Adrian Charles Kanaar, M.B. Lond., Albert Weinfield Lapin, M.D. McGill, Arthur Leese, L.R.C.P., Khalil Dorry Loutfy, M.B. Cairo, Neil Baird McGillivray, M.D. Toronto, Kelman Jacob Mann, M.B. Lond., Nicholas Henry Martin, M.B. Oxfd, Harry Kirby Meller, M.B. Camb., Jeremiah Noah Morris, L.R.C.P., Basil Gerald Parsons-Smith, L.R.C.P., Richard Basil Perkins, M.B. Sydney, Edward Gregson Grant Rhind, M.B. Aberd., Elizabeth Joan Rooke, M.B. Lond., Douglas Ronald Seaton, M.B. Camb., Omond McKillop Solandt, M.D. Toronto, Wilfred James Stokes, M.D. Lond., Waman Dattatraya Sulakhé, M.B. Bombay, and Carmichael Aretas Young, M.B. Lond.

Licences to practise were conferred upon 205 candidates (179 men and 26 women) who have passed the final examination in medicine, surgery and midwifery of the conjoint board and have complied with the by-laws of the college. The following are the names and medical schools of the successful candidates :—

D. J. A. Alban-Jones, Guy's ; Edith M. M. Alexander, Birm. ; F. I. C. Apted, St. Thos. ; N. H. Ashton, Westminster ; N. B. Atkin, Camb. and Middlesex ; Ailsa Bannerman, Roy. Free ; Diana E. Barbour, King's Coll. ; J. D. M. Barton, St. Thos. ; J. R. Belcher, St. Thos. ; H. E. Bentley, Charing Cross ; Anna M. Berry, Univ. Coll. ; T. P. Blanshard, St. Bart.'s ; T. M. Brand, Manch. ; A. E. Brewer, St. Mary's ; D. J. Brewer, Cardiff ; M. P. Browne, Middlesex ; H. R. Calderwood, Univ. Coll. ; D. H. Campbell, St. Bart.'s ; Diana M. M. Carr, Roy. Free ; R. N. Cates, St. Bart.'s ; F. E. de W. Cayley, Middlesex ; Anna W. Chacko, Madras and West Lond. ; R. G. Chapman, Guy's ; T. H. W. Clarke, St. Bart.'s ; A. G. H. Clay, Camb. and St. Thos. ; M. J. Cole, St. Bart.'s ; H. J. Cornelius, St. Thos. ; E. R. T. Crabb, St. Bart.'s ; N. L. Crabtree, King's Coll. ; G. P. Crean, St. Thos. ; B. C. Curwood, Birm. ; P. J. Cutler, Univ. Coll. ; M. A. Dave, King's Coll. ; I. R. Davies, St. Bart.'s ; E. M. E. Decottignies, King's Coll. ; J. E. Dickson, Middlesex ; Dean Dunbar, Leeds ; J. R. Dunn, St. Bart.'s ; E. S. Elliott, Oxfd and St. Thos. ; R. G. Evans, King's Coll. ; Bernard Fairburn, Middlesex ; Thomas Faulkner, Camb. and St. Bart.'s ; D. A. Ferguson, Univ. Coll. ; Philip Firstenberg, Univ. Coll. ; L. R. Flowers, St. Mary's ; J. C. Ford, Univ. Coll. ; Paul Forgacs, Guy's ; E. L. Frankel, St. George's ; Abraham Freedman, London ; Barnett Freedman, Middlesex ; J. M. French, Guy's ; B. A. Furniss, London ; Oliver Garrod, St. Bart.'s ; Hyman Glatston, St. Bart.'s ; Hanns-Martin Goldberg, Univ. Coll. ; J. A. S. Green, St. Thos. ; Harry Greenburgh, Guy's ; W. E. Greenwood, Guy's ; T. B. Griffiths, Westminster ; F. W. Gunz, St. Bart.'s ; Phœbe H. Guy, Birm. ; G. L. Haine, St. Mary's ; Joan M. E. Hannaford, Camb. and Roy. Free ; Kathleen M. Harding, King's Coll. ; Anthony Hargreaves, Camb. and Univ. Coll. ; W. R. L. Harrison, Guy's ; A. B. Hassan, Singapore ; E. A. Heaslett, Camb. and St. George's ; Joan F. Hefternan, Roy. Free ; W. M. R. Henderson, St. Thos. ; B. L. Heydon, Camb. and St. Thos. ; T. L. Hilliard, Westminster ; P. N. Holmes, Manch. ; R. E. Horton, Guy's ; A. C. C. Hughes, Camb. and Guy's ; P. W. Hunt, Middlesex ; T. B. Hutton, Camb. and St. Thos. ; W. H. Hylton, Leeds ; J. D. H. Iles, London ; Yehezkel Ivenitzki, London ; C. A. Jackson, St. Bart.'s ; W. H. James, Westminster ; D. G. Jarman, Cardiff ; M. A. K. Javid, Univ. Coll. ; E. M. K. Jellicoe, Middlesex ; D. A. H. Johnson, Guy's ; R. G. H. Jones, Univ. Coll. ; Cyril Joseph, London ; D. N. Kelsey, St. Bart.'s ; J. A. Kennedy, Univ. Coll. ; J. J. Kennedy, St. Thos. ; P. J. M. Kent, Guy's ; C. W. Kesson, Guy's ; P. D. C. Kinmont, King's Coll. ; Harry Kopelman, St. George's ; Herold Kyng, Univ. Coll. ; Harold Le Vay, Westminster ; O. G. Lane, Guy's ; Joan V. Laughlin, Univ. Coll. ; R. F. Lawrence, Leeds ; R. S. Lawrie, Middlesex ; H. A. Lee, Guy's ; H. W. Lees, St. Mary's ; M. M. Leigh, Manch. ; W. S. Lewin, Univ. Coll. ; D. C. Light, Guy's ; R. G. Linton, Edin. ; Percy Louis, Univ. Coll. ; Joan E. Mackworth, Brist. ; K. S. MacLean, Camb. and Guy's ; N. L. McNeil, Guy's ; L. M. Magurk, Middlesex ; G. S. Mansell, Univ. Coll. ; M. L. Mason, St. Bart.'s ; J. B. L. Mathur, Lucknow ; E. B. Meyrick, Univ. Coll. ; Udipi Mohan Rao, Madras ; Brendan Moore, London ; R. T. Moore, Brist. ; Rosie Morris, Roy. Free ; K. D. Moynagh, St. Bart.'s ; R. S. Murley, St. Bart.'s ; P. W. Nathan, Middlesex ; C. D. Needham Middlesex ; Jean C. Nelson, Univ. Coll. ; C. M. Norman, Guy's ; A. W. N. Oatway, Camb. and St. Thos. ; Samuel Oram, King's Coll. ; D. J. Paddison, Charing Cross ; G. J. Parfitt, Guy's ; R. F. Parfitt, Guy's ; F. R. Park, Camb. and London ; Dorothy K. Paterson, Roy. Free ; J. H. Paterson, Univ. Coll. ; J. W. Perrott, St. Bart.'s ; W. D. B. Pettigrew, Sheff. ; Catherine F. Pimm, Univ. Coll. ; F. W. Pote, Charing Cross ; G. J. Potts, Charing Cross ; T. M. L. Price, Guy's ; C. J. F. Pulley, Charing Cross ; C. E. Quin, Charing Cross ; C. P. F. Quinnell, Guy's ; V. L. Redman, St. Bart.'s ; P. E. Rees-Davies, London ; C. H. J. Rey, Guy's ; A. L. Reynard, Westminster ; David Rice, Camb. and St. George's ; R. W. Riddle, St. Mary's ; Gladys M. Robertson, Birm. ; G. E. S. Robinson, Lpool ; R. G. Robinson, Guy's ; N. C. Rogers, St. Bart.'s ; C. J. Rooke, Camb. and Middlesex ; Jack Rubie, King's Coll. ; A. F. Russell, King's Coll. ; Ethne N. M. B. Ryan, Roy. Free ; J. K. Salmon, St. Bart.'s ; R. S. Savidge, St. Bart.'s ; Eva G. Seaton, Univ. Coll. ; Barbara J. Shorting, Roy. Free ; I. F. Smith, Camb. and London ; N. D. Smith, London ; W. E. Smithson, St. Mary's ; E. P. S. Snell, Oxfd and St. Thos. ; G. F. A. Somerset, Camb. and Univ. Coll. ; T. D. Spencer, Charing Cross ; W. E. Spring, Melb. ; David Stafford-Clark, Guy's ; B. E. C. Stanley, St. Mary's ; W. M. Stephens, King's Coll. ; G. E. Stoker, St. Bart.'s ; Margaret M. Strange, Roy. Free ; Raghavendra Sudhakar Rao, Madras ; P. D. Swinstead, St. Bart.'s ; L. R. Taylor, St. Bart.'s ; Norah G. Taylor, King's Coll. ; W. N. Taylor, St. Bart.'s ; Margaret D. Thomas, Roy. Free ; W. O. Thomas, Middlesex ; J. R. O. Thompson, St. Bart.'s ; P. G. Todd, St. Thos. ; M. A. Tombuk, Lpool ; R. D. Tonkin, St. George's ; Susan M. Tracy, Roy. Free ; F. G. Tucker, King's Coll. ; H. J. Voss, Guy's ; A. F. Wallace, King's Coll. ; J. F. H. Walton, London ; P. M. Ward, Westminster ; R. D. Ward, St. Thos. ; W. O. Whittaker, St. Bart.'s ; E. B. Wild, King's Coll. ; A. E. Wilkinson, St. Mary's ; C. G. Williams, St. Bart.'s ; C. P. Williams, Cardiff ; E. H. Williams, Guy's ; E. H. Williams, St. Bart.'s ; A. E. Wilson, Westminster ; B. D. R. Wilson, St. Thos. ; Elsie N. K. Wilson, Univ. Coll. ; E. R. Winkleman, St. George's ; Hermann Wolfsohn, Univ. Coll. ; Winifred Wynne, Birm. ; and N. A. F. Young, St. Bart.'s.

Diplomas were granted, jointly with the Royal College of Surgeons, to the following candidates :—

*D.P.H.*—Minnie Atkin, G. O. A. Briggs, E. H. Capel, Annys M. Cusack, P. M. Davies, J. A. C. Franklin, J. W. K. Harper, E. A. Hoare, R. R. Leaning, J. J. Linehan, T. B. Mirchandani, H. G. G. Robertson, J. B. L. Tombleson, D. H. Waldron and M. K. Wasti.

*D.T.M. & H.*—M. G. Hyder, Ian MacKay and Sachindranath Mukherjee.

*D.A.*—Joseph Adams, Hazel R. B. Allison, D. H. Belfrage, J. H. T. Challis, A. P. L. Cogswell, W. L. Colquhoun, Joan Cooper, E. A. Critien, Charles Cunningham, Frank De Netto, Hilda M. Denton, Ruth Dovey, P. J. Drury Byrne, J. R. Duerden, E. C. Faraker, G. L. Feneley, Morris Fisher, F. W. Fullerton, V. F. Hall, K. McK. Heard, J. W. Heney, J. A. Hill, W. I. T. Hotten, J. S. Hudson, G. L. Jepson, B. R. M. Johnson, John Johnston, H. A. Kelly, A. D. Lamphee, W. A. Low, K. E. Madan, G. G. Marshall, W. T. D. Mart, Edward Moir, R. H. Moore, E. B. Murrell, B. L. S. Murtagh, F. L. Napier, Annie F. P. Pillans, D. G. Renton, J. F. Ryan, E. A. Scott, V. E. Vessell, E. H. Watts, J. H. Way, Marion K. B. Whyte, and J. D. Young ; and to those candidates named in the report of the meeting of the Royal College of Surgeons in the *Lancet* of Dec. 17.

Diplomas in psychological medicine and in laryngology and otology were also granted to those candidates named in the report of the meeting of the Royal College of Surgeons in our issue of Jan. 21.

## British Institute of Philosophy

An address on the permanent significance of Hume's philosophy will be given by Prof. H. H. Price at University College, Gower Street, London, W.C.1, at 8.15 P.M. on Tuesday, Feb. 14. Cards of admission may be had from the director of studies at 14, Gordon Square, W.C.1.

## Hospital Conference

A conference was held at the Ministry of Health on Jan. 27 under the chairmanship of Sir George Chrystal, to consider questions affecting the voluntary hospitals in London. The conference took place at the suggestion of the King Edward Hospital Fund and the voluntary hospitals committee for the County of London. The London County Council and London University also sent representatives.

## University of London

Dr. John McMichael has been appointed to the university readership in medicine at the British Postgraduate Medical School. Mr. W. T. J. Morgan, D.Sc., has been appointed to the university readership in biochemistry at the Lister Institute of Preventive Medicine.

Dr. McMichael is 34 years of age. He was educated at Kirkcudbright Academy and in the University of Edinburgh where he was designated the most distinguished graduate of the year in 1927. After holding house appointments at the Royal Infirmary, Edinburgh, and at Paddington Green Children's Hospital, London, he returned to Edinburgh University in 1929 as Goodsir fellow to work in the departments of pathology and surgery. In 1930 he became M.R.C.P.E., and for the next four years he held a Beit fellowship, working first as assistant to the professor of medicine in the University of Aberdeen, and later as clinical assistant to Dr. J. W. McNee at University College Hospital, London, with whom he made a special study of the splenic anæmias. In 1934 he was appointed lecturer in human physiology in the University of Edinburgh, and since 1936 he has been Johnston and Lawrence research fellow of the Royal Society and extra hon. assistant physician at the Royal Infirmary, Edinburgh. He was awarded the gold medal for his M.D. thesis in 1933 and was elected F.R.S.E. in 1936. Besides his work on the splenic anæmias Dr. McMichael has published papers on portal and hepatic circulation and on cardiac output in man.

Dr. Morgan, who is 38, studied at East London College (now Queen Mary College) and obtained his B.Sc. degree with honours in chemistry in 1922. While holding a post as a research chemist he began to study physiology at University College, and in 1925 he was elected to a Grocers' Company research studentship at the Lister Institute. In 1927 he obtained his Ph.D. in biochemistry. In the same year he was awarded a Beit research fellowship and elected a fellow of the Institute of Chemistry. Since 1929 he has been biochemist and first assistant in the serum department of the Lister Institute at Elstree. In 1937 he was awarded a Rockefeller fellowship and spent a year in Zürich working under Prof. T. Reichstein Last year he obtained his D.Sc. degree. He has done important work on the chemistry of bacterial antigens.

The William Julius Mickle fellowship for 1939 has been awarded to Prof. G. S. Wilson and Mr. P. G. Scott has been reappointed for a third year to the Geoffrey E. Duveen travelling studentship in otorhinolaryngology.

Prof. E. R. Flint will give two lectures on pre- and post-operative management of surgical cases at St. Bartholomew's Hospital medical college on Feb. 16 and 17, at 5.30 P.M. Admission will be without ticket.

## Royal College of Obstetricians and Gynæcologists

A meeting of the council was held on Jan. 28, with Prof. W. Fletcher Shaw, the president, in the chair. The following were elected to the membership:

Paul Cowell Barkla, Edinburgh; Anthony Charles, London; Stanley George Clayton, London; Stanley George Cumming, New Zealand; Jackson Cooper Cuthbert, Sunderland; David Alfred Davies, London; Molly Devenish-Meares, London; Alice Eleanora Dickie, London; James Edmett Giesen, London; Charles McTaggart Hopkins, Australia; Norman Kenneth Bernard Kimbell, London; Owen Vaughan Jones, Bangor; Arthur William Lawler, Canada; George Panton Milne, Aberdeen; Margaret Moore-White, London; Angus Johnston Murray, Australia; Edward Lawford Nicolson, Sheffield; Heriot Roland, Australia; Albertus Wynand Louw, South Africa; Thomas Frederick Rose, Australia; Sophie Schiller, South Africa; James Smibert, Australia; James Kenneth Sutherland, Edinburgh; and Eileen Mary Whapham, London.

The president was appointed to represent the college on the British Medical Association's central emergency committee, and Dr. T. Watts Eden was reappointed representative on the consultants' board of the association; Mr. J. P. Hedley was appointed representative on the council of the British Health Resorts Association and Mr. Aleck Bourne hon. curator of the college museum.

## Inns of Court

On Jan. 26 Dr. F. J. H. Crawford and Dr. M. C. Breese (Middle Temple) were called to the bar.

## Marriage Guidance Council

On Feb. 2 at the Kingsway Hall, London, W.C.2, Dr. E. F. Griffith gave the first of four weekly lectures arranged by the council. He spoke on the physical factors of sex and life, and on Feb. 9 Dr. J. A. Hadfield will deal with the psychological factors. On Feb. 16 Dr. Gilbert Russell will speak on sex problems of today, and on Feb. 23 Dr. Helena Wright will explain how to make a good job of marriage. Tickets for these lectures may be had from the secretary of the council, Brickfield, Harrow-on-the-Hill, or at the door of the hall.

## Society for the Protection of Science and Learning

A public meeting is being held by this society on Monday, Feb. 6, at 8.15 P.M. at University College, London, W.C.1, to launch a national appeal for funds for the work being done on behalf of academic refugees. The speakers will include Sir Samuel Hoare, Lord Reading and Sir Peter Chalmers Mitchell, F.R.S. Further information may be had from the secretary of the society, 6, Gordon Square, W.C.1.

## Dentists and National Service

A Dental Emergency Committee which has been set up by the Minister of Health in conjunction with the dental organisations has arranged for the establishment of a register of dentists willing to volunteer for national service in war-time. This register is being compiled on the basis of replies made by dentists to a questionnaire which has already been circulated to them. Those who have already completed and returned this questionnaire need not take any further action. Those who have not yet done so are asked to return it at once.

## *Medical Press and Circular* Centenary Dinner

Mr. Cecil Wakeley presided over a representative gathering at Claridge's Hotel on Jan. 25 to celebrate the centenary of the *Medical Press and Circular*. Lord Horder, proposing the principal toast, said they were gathered to pay tribute to a journal whose aim it had been, in the words of Prof. R. J. Rowlette its biographer, to interest the general practitioner, to keep him informed on the progress of medical knowledge, to protect his interests and to maintain the honour of the profession. Drawing freely on Prof. Rowlette's book he recalled the conditions in medicine at the time when the *Medical Press* first saw the light and when its first editor, Dr. Arthur Jacob—a man of dynamic character and boundless energy—had his finger in almost every medical pie which was cooked in Dublin. Jacob saw the need of organisation in the medical profession and the need also of developing and maintaining an ethical standard, and his journal played a conspicuous part in the foundation of the Irish Medical Association. His son who carried the same burden for another forty years achieved many reforms of a medico-political kind. Lord Horder concluded with an appreciation of the amazing energy of the present editor, congratulating him, his colleagues and his publishers and wishing them long and continued success. In reply Mr. Wakeley said it was through the medium of medical journals that knowledge gained by research was disseminated throughout the medical profession. Medicine had many branches and the specialist was as necessary in the various sections of medicine as in the other sciences. It was for the weekly medical journal to correlate the whole and give the general practitioner the opportunity of acquiring modern knowledge. Sir Humphry Rolleston proposed the other toast, that of Medical Journalism, throwing a gleam of light into the secrets of the editorial room. Editors were, he remarked, a modest race; they shunned the limelight but they had great experience and wide knowledge of human nature, as was shown by their dealings with contributors. They were merciful men too and they seldom recorded their reminiscences. If they did, what tales they could tell; they might indeed, if they ever had a contributor who would not do what they wanted, take revenge upon him (he was sure no editor was ever revengeful) by printing his article exactly as it was sent in. Mr. Eric Pearce Gould, responding, took another angle. Whatever might or might not be gained by those who read the medical journals, there was, he said, no doubt as to their immense value to those who contributed to them, in learning to reduce their knowledge to some extent at least to useful order. Medical journals had proved the testing place of many writers who had subsequently become prominent in the literature of our language. Mr. R. F. West, who also replied, hoped the day would come when someone would sit down and write the history of medical journalism. No man, he thought, could be a good editor or a good journalist unless he gave his best to his profession and derived pleasure from it. To him the celebration meant much because he was the great-grandson of the founder of the paper which would continue to serve the profession as well in the future as in the past.

### University College Hospital

Dr. E. L. Gwendolen Hilton has been appointed to the honorary medical staff of this hospital as radiotherapist.

### Nursing in an Emergency

The first meeting of the Central Emergency Committee for the Nursing Profession was held on Jan. 30 at the Ministry of Health, under the chairmanship of Sir Malcolm Delevingne. The object the Government have in view in compiling an emergency register is to ensure the provision and maintenance of a nursing reserve. The call to register is not addressed to those trained nurses (or nurses in training) who are at present actively employed in hospital, district or public health nursing; such nurses should, in the event of an emergency, continue in the work of national importance in which they are engaged. It is addressed to trained nurses engaged in work other than hospital, district or public health nursing, to trained nurses who have retired from active work or who are engaged in private nursing and to assistant nurses who are not employed in public institutions. Women who are willing to undertake a course of training as nursing auxiliaries in an emergency are advised to join the St. John Ambulance Brigade or the British Red Cross Society. If they do not wish to join one of these organisations they should send their names to the Central Emergency Committee at Romney House, Marsham Street, London, S.W.1.

### New Maternity Unit at Bradford

On Jan. 26 Sir Comyns Berkeley, chairman of the Central Midwives Board, opened a new maternity unit at St. Luke's Hospital, Bradford. After paying tribute to the work of Dr. John Buchan as medical officer of health he recalled that in 1915 Bradford was the first local authority to open a maternity hospital, that in the following year it was the first to engage municipal midwives, and that about this time it was also the first to institute a municipal general hospital, to which members of the honorary staff of the Bradford Royal Infirmary were appointed consultants. This was a remarkable example of municipal foresight. The new unit, he continued, embodied two somewhat novel and important decisions: the first was that each patient after her confinement would be kept in a single-bedded room for a week, so as to prevent the possible spread of infection; the second was that only those women who had attended the outpatient antenatal department regularly during their pregnancy would be admitted to the unit, the others being sent to the maternity wards of the general hospital, or, if infected, to the fever hospital. In conclusion, Sir Comyns spoke of the necessity that midwives should not only be paid reasonable and appropriate salaries but also should receive the public recognition of their status which was their right. Until recent times the general public had failed to appreciate the very important contribution that midwives had made to the well-being of the community. The Midwives Act of 1936 was altering all this; the status of midwives had been raised, and they no longer felt that their prospects of remuneration and promotion to higher posts were inferior to those of other callings. But the community must realise that if it desired a maternity service as good as the best in any country it would have to pay the price. Such a service could not be obtained at bargain-basement prices. He believed that if the conditions of service were made sufficiently attractive there would be no lack of entrants. There were indeed indications that the improvements made in the midwifery profession would lead to an improvement in the general conditions of the nursing profession.

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THE Index and Title-page to Vol. II, 1938, which was completed with the issue of Dec. 31, is now ready. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

# Vacancies

*For further information refer to the advertisement columns*

*Altrincham, Cheshire, St. Anne's Hosp.*—Res. surg. O., £200.
*Aylesbury, Bucks Mental Hosp., Stone.*—Psychiatric clinical assistantship.
*Aylesbury, Royal Buckinghamshire Hosp.*—Sen. res. M.O., at rate of £200.
*Bath and Wessex Children's Orthopædic Hosp., Combe Park.*—H.S., at rate of £120.
*Belfast Royal Maternity Hosp.*—Two res. M.O.'s, each at rate of £52.
*Birmingham, Erdington House.*—Asst. res. M.O., £300.
*Birmingham, Monyhull Colony.*—Res. asst. M.O., £350.
*Bristol, Barrow Hosp. for Nervous and Mental Diseases.*—Res. H.P., at rate of £200.
*Bristol Eye Hosp.*—Jun. H.S., at rate of £100.
*British Postgraduate Medical School, Ducane Road, W.*12.—Two cas. O.'s, each at rate of £150.
*Cambridge, Addenbrooke's Hosp.*—H.S. and H.S. to special depts., each at rate of £130.
*Cardiff Royal Infirmary.*—Radium registrar, £200.
*Central London Ophthalmic Hosp., Judd Street, W.C.*1.—Sen. and jun. H.S.'s, £120 and £100 respectively.
*Dorchester, Dorset County Hosp.*—H.S., at rate of £150.
*Dreadnought Hosp., Greenwich, S.E.*10.—Physician with charge of outpatients.
*Dublin, Jervis Street Hosp.*—Two surg. registrars.
*Ealing, King Edward Memorial Hosp.*—Cas. O. and H.S., at rate of £150.
*East End Maternity Hosp.*, 396, *Commercial Road, E.*1.—Res. obstet. M.O. and obstet. reg., £400.
*East Ham Memorial Hosp., Shrewsbury Road, E.*7.—H.P., at rate of £150.
*Exeter, Wonford House.*—Asst. M.O., £350.
*Gloucester Royal Infirmary.*—Asst. to radiological dept., £500.
*Golden Square Throat, Nose, and Ear Hosp., W.*1.—Clin. asst.
*Grimsby and District Hosp.*—Res. orthopædic officer, at rate of £225.
*Halifax County Borough.*—Asst. M.O.H.—maternity and child welfare, £500.
*Haywards Heath, The King Edward VII Memorial, Eliot Hosp.*—Hon. surgeon.
*His Majesty's Colonial Service.*—Medical Officers.
*Hosp. for Sick Children, Great Ormond Street, W.C.*1.—Res. med. asst. and clin. pathologist, £125.
*Hounslow Hosp., Middlesex.*—Anæsthetist, £1 1s. per session.
*Huddersfield, St. Luke's Hosp.*—Res. M.O., £230.
*Hull, Beverley Road Institution.*—Asst. M.O., £350.
*Hull City Mental Hosp., Willerby.*—Second asst. M.O., £500.
*Hull Royal Infirmary.*—Second cas. O, at rate of £150.
*Ilford, King George Hosp.*—Hon. anæsthetist.
*Inverness, Royal Northern Infirmary.*—Two H.P.'s, each £100.
*Kendal, Westmoreland County Hosp.*—H.S., at rate of £200.
*Kingston-upon-Thames Royal Borough.*—Med. asst. to M.O.H., £600.
*Leicester Royal Infirmary.*—Two res. anæsthetists, each at rate of £150. Also H.P.'s, H.S.'s, and Cas. O.'s, each at rate of £125.
*Leyton Borough.*—Deputy M.O.H. and deputy school M.O., £750.
*London County Council.*—Ophthalmologist, £200.
*London Hosp., E.*1.—Clin. asst. in X-ray dept., £100.
*London Jewish Hosp., Stepney Green, E.*1.—Surg. reg., 60 guineas.
*Manchester, Ancoats Hosp.*—Two H.S.'s, each at rate of £100.
*Manchester, Crumpsall Hosp.*—Res. asst. M.O., £200.
*Manchester, St. Mary's Hosps.*—Asst. res. obstetric officer for Whitworth Street Hosp., at rate of £100.
*Mansfield and District General Hosp.*—H.S., at rate of £150.
*Middlesbrough, Education Committee.*—Asst. school M.O., £500.
*Middlesex County Council.*—Third asst. M.O. for Middlesex Colony, Shenley, £365.
*Miller General Hosp., Greenwich Road, S.E.*10.—H.P. and H.S. each at rate of £100.
*Mitcham, Cumberland House Hosp.*—Res. asst. M.O., £350.
*Northampton General Hosp.*—Cas. O., H.S., and H.P., each at rate of £150.
*Norwich, Norfolk and Norwich Hosp.*—H.S., £120.
*Nottingham City Council.*—Temporary physician, £15 per week.
*Oldham, Infectious Diseases Hosp.*—Asst. M.O.H. and res. M.O., £350.
*Oswestry, Robert Jones and Agnes Hunt Orthopædic Hosp.*—H.S., at rate of £200.
*Oxford University.*—Graduate asst. in dept. of pathology at Radcliffe Infirmary, £251–£300.
*Penshurst, Kent, Cassel Hosp. for Functional Nervous Disorders.* Locum tenens, 8 guineas a week.
*Portsmouth, Royal Hosp.*—H.P., at rate of £130.
*Portsmouth City.*—Res. M.O. at Infectious Diseases Hosp. and asst. M.O.H., £500.
*Prince of Wales's General Hosp., N.*15.—Jun. H.P. and two jun. H.S.'s, each at rate of £90.
*Princess Elizabeth of York Hosp. for Children, Shadwell, E.*1.—Hon. radiologist for X ray and electro-therapeutical dept.
*Queen Charlotte's Maternity Hosp., Marylebone Road, N.W.*1.—Res. anæsth., at rate of £100. Res. anæsth. and dist. res. M.O., at rate of £90. Also asst. res. M.O., at rate of £80.
*Rochdale Infirmary and Dispensary.*—H.P., £150.
*Royal Air Force.*—Commissions.
*Royal Naval Dental Service.*—Dental officers.
*Royal Naval Medical Service.*—M.O.'s.
*Royal Northern Hosp., Holloway, N.*7.—Obstet. H.S., at rate of £70.
*St. Bartholomew's Hosp., E.C.*1.—Helen Cave Memorial Scholarship, £200.
*St. Helens County Borough.*—Asst. M.O.H., £500.
*St. John's Hosp., Lewisham, S.E.*13.—Res. cas. O., at rate of £100.

*St. Mary's Hosp., W.2.*—Res. anæsthetist, at rate of £125.
*Salisbury General Infirmary, Wilts.*—Two H.S.'s, each at rate of £125.
*Sheffield, Children's Hosp.*—Hon. ophth. surgeon. Also H.P., at rate of £100.
*Sheffield Royal Hosp.*—Vacancy on resident staff, at rate of £80.
*Southampton Children's Hosp. and Dispensary for Women.*—Res. M.O., at rate of £150.
*Sutton and Cheam Hosp.*—Jun. res. M.O., at rate of £150.
*Torquay, Torbay Hosp.*—H.S., £175.
*Wallingford, Berkshire Mental Hosp.*—Deputy med. supt., £600. Also third asst. M.O., £350.
*Walsall General Hosp.*—Cas. H.S., at rate of £150.
*Warwick, King Edward VII Memorial Sanatorium, Hertford Hill.*—Jun. asst. M.O., at rate of £250.
*West Ham County Borough, Education Department.*—Sen. school dental officer, £600.
*West London Hosp., Hammersmith Road, W.6.*—Res. surg. reg. and tutor, £225.
*West Riding of Yorkshire County Council, Public Health Laboratory.*—Asst. bacteriologist. £500.
*Wolverhampton Royal Hosp.*—Res. anæsthetist, at rate of £200.
*Woolwich and District War Memorial Hosp., Shooters Hill, S.E.18.*—Hon. asst. surgeon and hon. asst. obstet. surgeon. Also H.S., at rate of £100.

# Medical Diary

*Feb. 6 to Feb. 11*

## SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.
TUESDAY.
*Pathology.* 8.15 for 8.30 P.M., laboratory meeting at University College Hospital medical school, University Street, Gower Street, W.C.1.
*Orthopædics.* 8.30 P.M., Mr. H. A. T. Fairbank and Mr. Harry Platt: Congenital Dislocation of the Hip. Mr. D. N. Rocyn Jones will also speak.
FRIDAY.
*Clinical Surgery.* 4.45 P.M. (cases at 4 P.M.). Mr. J. E. H. Roberts: The Clinical and Surgical Aspects of Thoracic Neoplasms. Dr. Maurice Davidson, Mr. G. A. Mason and Dr. C. E. Lakin will also speak. Dr. Hope Gosse: Primary Carcinoma of Lung. Mr. A. Tudor Edwards: (1) Endothelioma of Lower Lobe, (2) Chondroma of Lung, (3) Carcinoma of Bronchus, (4) Teratoma of Mediastinum. Dr. F. G. Chandler: (1) Ganglioneuroma in a Child with Extreme Paraplegia, (2) Mediastinal Teratoma in a Young Woman. Dr. A. L. Punch: (1) Malignant Growth of Thymus, (2) Carcinoma of Lung. Mr. Zachary Cope: Large Intrathoracic Goitre. Mr. Cecil Joll: Intrathoracic Goitres. Dr. J. Browning Alexander: (1) Carcinoma of the Lung, (2) Malignant Intrathoracic Growth. Mr. C. Price-Thomas and Dr. W. Ernest Lloyd: (1) Carcinoma of the Lung 2¾ Years After Pneumonectomy, (2) Paratracheal Cyst, (3) Intrathoracic Chondroma Growing from the Chest Wall. Dr. H. V. Morlock: (1–2) Adenoma, (3) Fibroadenoma. Mr. R. C. Brock: (1 and 2) Epidermoid and Dermoid Cysts of Mediastinum, (3) Ganglioneuroma of Superior Mediastinum. Dr. E. Boland: Thymoma Removed by Operation. Mr. T. Holmes Sellors: (1–3) Carcinoma of the Lung treated Operatively. Dr. Eric Hudson: Fibromatous Polyp of Bronchus. Dr. Lee Lander: Two Unusual Types of Growth. Dr. Philip Ellman: (1) Mediastinal Dermoid Cyst, with Bronchiectasis, (2) Carcinoma of the Lung with Carcinomatous Abscess.
*Ophthalmology.* 8.30 P.M. (cases at 8 P.M.). Mr. T. Pomfret Kilner and Prof. Joseph Imre (Budapest): Plastic Surgery in Relation to the Eye.

HARVEIAN SOCIETY OF LONDON.
THURSDAY.—8.30 P.M. (26, Portland Place, W.1), clinical meeting.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.
FRIDAY.—8.45 P.M. (Miller General Hospital, Greenwich, S.E.10): Dr. Alastair Gunn: Some Recent Advances in Midwifery.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
THURSDAY.—8.30 P.M. (11, Chandos Street, W.1), Mr. Claud Mullins: On Delinquency.

BIOCHEMICAL SOCIETY.
FRIDAY.—3.45 P.M. (Lister Institute, Chelsea Bridge Road, S.W.1), short communications and demonstrations.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2.
MONDAY.—5 P.M., Mr. F. J. Sambrook Gowar: The post-operative Complications of Pulmonary Lobectomy.
WEDNESDAY.—5 P.M., Mr. Ronald Edwards: Experimental Pneumonectomy and the Development of a Two-stage Operation for the Removal of a Whole Lung.
FRIDAY.—5 P.M., Mr. J. H. Mulvany: A Differentiation in the Mechanism, Symptomatology, Pathology and Treatment of Two Types of Exophthalmos Occurring in Association with Thyrotoxicosis. (Hunterian lectures.)

UNIVERSITY OF LONDON.
MONDAY and WEDNESDAY.—5 P.M. (University College, W.C.1), Prof. J. H. Burn: The Action of Drugs in Muscular Fatigue and as Circulatory Restoratives.

TAVISTOCK CLINIC, Malet Place, W.C.1.
MONDAY.—4.30 P.M., Dr. H. V. Dicks: Hysteria.
THURSDAY.—4.30 P.M., Dr. T. W. Mitchell: Puberty and Adolescence.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Dr. T. C. Stamp: Active Immunisation in Therapeutics. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. E. C. Dodds: Hormones in Relation to Medicine and Pathology.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. Eardley Holland: Cæsarean Section.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. R. Watson-Jones: Fracture Dislocations and Other Injuries of the Joints.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. GEORGE'S HOSPITAL, S.W.1.
THURSDAY.—5 P.M., Dr. E. T. O. Slater: psychiatric demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W.C.1.
THURSDAY.—2 P.M., Dr. Bertram Shires: X-ray Interpretation of Diseases of the Chest. 3 P.M., Dr. W. W. Payne: Control of a Case of Diabetes in a Child.
Outpatient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen Square, W.C.1.
MONDAY.—3.30 P.M., Dr. C. Hinds Howell: Disseminated Sclerosis.
TUESDAY.—3.30 P.M., Dr. J. Purdon Martin: Neurosyphilis (2).
WEDNESDAY.—3.30 P.M., Dr. F. M. R. Walshe: clinical demonstration.
THURSDAY.—3.30 P.M., Mr. T. E. Cawthorne: Methods of Testing the Auditory Nerve.
FRIDAY.—3.30 P.M., Dr. D. E. Denny-Brown: Spinal Compression.
Outpatient clinics daily at 2 P.M.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn Road, W.C.1.
FRIDAY.—4 P.M., Mr. F. W. Watkyn-Thomas: Vertigo.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.3.
WEDNESDAY.—4 P.M., Mr. H. Lawson Whale: Foreign Bodies in the Ear, Nose and Throat.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh Road, S.W.1.
FRIDAY.—3.30 P.M., Dr. Albert Eidinow: Indication for General and Local Light Therapy in the Rheumatic Diseases.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2.
TUESDAY.—5 P.M., Dr. H. T. Barron: Common Skin Diseases in Childhood.
THURSDAY.—5 P.M., Dr. J. L. Franklin: Bullous Eruptions. (Chesterfield lectures.)

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.
MONDAY to SATURDAY.—GORDON HOSPITAL, Vauxhall Bridge Road, S.W.1, all-day course in proctology.—ST. JOHN'S HOSPITAL, 5, Lisle Street, W.C.2, afternoon course in dermatology. (Open to non-members.)

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY.—4 P.M. (St. James' Hospital, Ouseley Road, S.W.12), Mr. George Perkins: Manipulative Surgery.

LEEDS GENERAL INFIRMARY.
TUESDAY.—3.30 P.M., Mr. P. J. Moir: demonstration of surgical cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY.—4.15 P.M. (Royal Mental Hospital, Gartnavel), Dr. Angus MacNiven: Manic-depressive Psychoses.

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". . . It was inevitable that science should have gradually displaced the ancient superstitions and taboos attaching to the medical man whereby it was inconceivable for him to be imperfect. So long as the medical man could not bear to examine his own psychology he could not logically concede it to have any importance among the clinical data of his patients. Among the discoveries of Freud, perhaps the greatest are those pertaining to the scientific study of the emotional bonds which develop between the patient and the physician. So long as it was taboo for the doctor to ask himself, 'Why am I a physician? Why am I interested in disease? Why does the specialty of pediatrics appeal so to me?' and similar questions, it was necessary also to avoid, 'Why did the patient expose himself to syphilis? When did the gastric ulcer patient begin to hate his wife? What is the purpose of this woman's illness?' For are not the wishes, the dreams and desires, the fears, and hates and envies of a patient as much a product of his being as his urine, his blood, his spinal fluid? Are they not as deserving of analysis and as amenable to treatment measures?"—KARL A. MENNINGER *N.Y. St. J. Med.* 1938, **38**, 922.

# NOTES, COMMENTS, AND ABSTRACTS

## TWO PIECES OF TEACHING APPARATUS FOR STUDENTS AND PUPIL-MIDWIVES

By KENNETH McMILLAN, F.R.C.S.

HON. SURGEON TO THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN AND TO THE BIRMINGHAM MATERNITY HOSPITAL; EXAMINER TO THE CENTRAL MIDWIVES BOARD

### "DISPROPORTION"

THE first piece of apparatus (fig. 1) consists of the standard leather dummy used with a dry pelvis to demonstrate certain mechanisms in obstetrics; but a small rubber bladder has been substituted for the leather-covered head. A piece of heavy pressure tubing is attached to this rubber bladder to form the neck and is prolonged through the trunk of the dummy and out at the umbilicus to form the umbilical cord. To the distal end of this are inserted the valve and rubber bulb of any standard blood-pressure apparatus. This enables the rubber bladder representing the fœtal head to be inflated to various sizes in relation to the dry pelvis, thus demonstrating very clearly to anyone not mechanically minded the exact significance of disproportion resulting either from a true contracted pelvis, a large baby, post-maturity, or hydrocephalus. It is particularly valuable, I think, in emphasising the extreme importance of the routine head-fitting at the 36th week.

A suitable and inexpensive bladder is that of a toy football; these are made by most of the large rubber firms for about a shilling and can be inflated from a size slightly smaller than that of the normal fœtal head at about 36 weeks to that of a moderate-sized hydrocephalus. The heavy pressure tube forming the neck should be inserted by means of a moulded rubber motor-tyre valve into a point somewhat nearer one pole than the other, thus imitating the insertion of the fœtal spine nearer the occiput than the sinciput. The flexible rubber valve-stem enables the importance of flexion and deflexion of the fœtal head to be duly emphasised.

### PRESENTATIONS

The second piece of teaching apparatus (fig. 2) is complementary to the above-described apparatus and especially demonstrates the obstetric mechanisms in a more diagrammatic way.

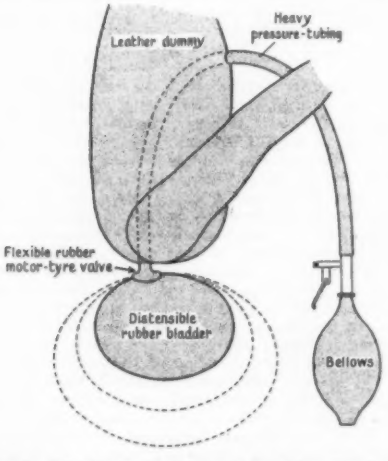
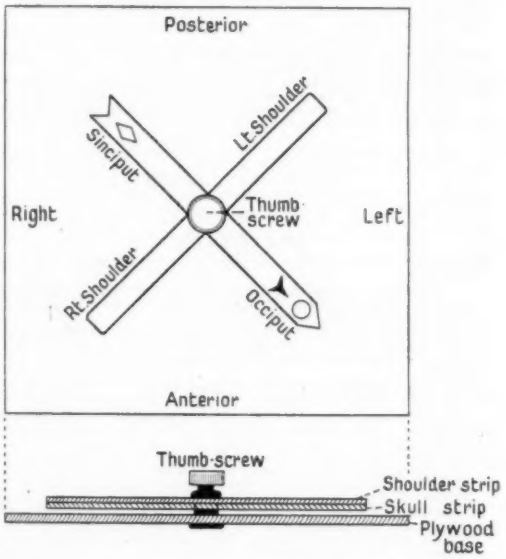



FIG. 1—The leather dummy with distensible head.

It consists of a square of thin plywood (about 4-ply) and two strips of thin wood of equal length attached through their centres to the centre of the square by a simple thumb-screw, so that they can be turned together or independently but will stay in whatever position they are moved to, according to the tightness of the thumb-screw. The square is marked in bold letters "anterior," "posterior," "right," and "left" on the respective sides. The right and left oblique diameters are also marked in the two corners between the two sides behind. The lower strip, representing the long axis of the fœtal skull, is marked at one end with an O and a small three-rayed star, representing the posterior fontanelle, and at the other end with an S and a diamond, representing the anterior fontanelle. The upper strip is marked "right shoulder" at one end and "left shoulder" at the other.

FIG. 2




To demonstrate some of the mechanism of an ordinary left occipito-anterior presentation, the lower strip is placed in the right oblique diameter of the pelvis with the occiput pointing towards the left ilio-pectineal eminence; the shoulder strip is placed at right angles in the left oblique diameter and is held there by a finger; the occipital end is then rotated inwards in accordance with Hart's law until it lies in the antero-posterior diameter of the outlet, thus demonstrating internal rotation of the occiput through an eighth of a circle and the twist put upon the neck, the shoulders still being in the left oblique diameter. It is then assumed that the head is born by extension, and, as soon as it is free, the occiput rotates externally an eighth of a circle again to undo the twist of the neck, thus demonstrating restitution. After this, the right shoulder is rotated inwards towards the middle line, and, as it does so, the occipital strip is seen to rotate externally another eighth of a circle, thus demonstrating external rotation. The shoulders are then born in the antero-posterior diameter of the outlet with the head at right angles to the trunk.

To demonstrate the mechanism of a left occipito-posterior position, the occiput is placed behind in the left oblique diameter of the pelvis and the shoulder strip in the right oblique diameter. With full flexion at the commencement of labour the occiput begins its long rotation forwards until it reaches the right oblique diameter; the shoulders being free and high up in the pelvis at this stage change into the left oblique diameter. From this point onwards the mechanism is the same as for a normal L.O.A. The occipital strip rotates internally another eighth until it comes under the symphysis, the shoulder strip being held by the finger still in the left oblique diameter. The head is then born by extension and, when free, rotates externally an eighth of a circle to undo the twist of the neck (restitution). The anterior right shoulder then rotates internally an eighth of a circle, coming under the symphysis pubis and carrying the head another eighth of a circle externally. The shoulders are then delivered in the anterio-posterior diameter of the pelvis with the head at right angles to the trunk.

## A SOCIAL SURVEY OF BRISTOL

FOLLOWING the example set by London, Liverpool and Southampton Universities, the University of Bristol began in 1937 to study the social conditions of the city in which it is situated. With funds supplied by the Colston Research Society and with Mr. Herbert Tout, M.A., as director of the survey, an ambitious scheme of household inquiry was embarked upon. A preliminary report [1] shows that it met with a very great success, for few of the randomly chosen families refused to coöperate, particulars being obtained from nearly 4500 households.

The report is limited to the standard of living found in families below middle-class levels when industrial conditions were most favourable. As is customary, an attempt was first made to define the minimal requirements of families of different types, so that the income of each might be compared with its estimated needs. It is not easy to assess the latter, for opinions differ considerably on the amount and kinds of food necessary for persons of different ages and on the costs of clothing, warmth and other items. The dietary recommended by the B.M.A. committee was adopted. The results are certainly not extravagant, for the family needs for food, clothes, fuel, light and cleaning are placed as follows: man, wife and one child, between 24*s.* 4*d.* and 27*s.* 4*d.* a week (according to the age of the child); man, wife and two children aged 5–9 and 10–13, 32*s.* 10*d.*; man, wife and three children aged 0–4, 5–9 and 10–13, 37*s.* 8*d.* No allowance is made for sickness, savings, holidays, recreation, furniture, tobacco, drink, newspapers or postage. From the total recorded income the amounts spent on rent, insurances and travel were deducted, and this net income was compared with the needs referred to above. The result is that 89·3 per cent. of the families investigated were, in the week of investigation, above the minimal standard, while 10·7 per cent., or 1 in 9, were below.

The conclusion drawn by Mr. Tout is that at this time of relative prosperity 12 per cent. of the working-class families could be classed as "comfortable," 56 per cent. with sufficient income for ordinary living, 21 per cent. with insufficient and hard put to it to make a decent home and 11 per cent. in actual poverty. In absolute figures this gives about 68,000 families above the sufficiency level, 21,000 who have a hard struggle to make ends meet and 11,000 in poverty. Dissection of these figures with regard to age is illuminating. The proportion of persons below the standard is some 20 per cent. at ages under 15, falls to a minimum of 4–5 per cent. at ages 20–30, rises to 11–12 per cent. at 35–44, as family obligations probably increase, and then remains at 8–9 per cent. up to age 70. One working-class child in every five, therefore, comes "from a home where income is inadequate to provide a bare minimum standard, according to the austere survey rules." The percentages falling below increase steadily as the number of children increases, and it appears that, if the now relatively few families with three or more children could be raised to a higher level, a great part of the problem would be solved. In this area the most important reason for family income falling below needs was unemployment, with insufficient wages to support the family of the worker next in order.

This preliminary report is a clear and well-balanced statement, and the final account, which will touch on many other aspects of life in Bristol, will be awaited with interest.

1. Tout, H., The Standard of Living in Bristol. A preliminary report of the work of the University of Bristol Social Survey, 1938.

## HEALTH AND DISEASE IN THE ROYAL NAVY

THANKFULNESS for the existence of our navy is traditionally expressed by army instructors but is also widely shared, and many will be interested in the Report of the Health of the Royal Navy for 1936, published by H.M. Stationery Office at 2*s.* 6*d.*

It is noteworthy that during 1936 no disease attained epidemic proportions in the Service. Thus there were only 595 cases of influenza as compared with 762 in the previous year, and 3770 in 1933. Of the 736 cases of enteritis recorded, more than half were reported in the Mediterranean and China stations. The case-mortality rate of 1·09 per cent. in 546 cases of appendicitis is by no means discreditable, while among the 138 cases of lobar pneumonia there were only 10 deaths. A total of 197 cases of pulmonary tuberculosis is recorded; 176 of these patients were invalided and 17 died. The importance of early diagnosis of this condition among men living at close quarters can hardly be over-emphasised. Another disease which has to be reckoned with in the Service is malaria, but there were only 207 cases, most of them in the China and East Indies stations. A substantial and satisfactory decline in the incidence of syphilis has taken place, the number of fresh infections falling from 424 in 1935 to 341 in 1936; but gonorrhœa increased from 2842 in 1935 to 3085 in 1936. Other information included is the statement that Böhler's methods have been adopted in the treatment of fractures and that phenobarbitone, in doses of 1 grain at night, has apparently proved of value in preventing traumatic headache after head injury.

We cannot help hoping that means will be taken to hasten the appearance of these annual reports. It will be a pity for example if we have to wait another two years before getting the official account of the important tests of chemotherapy in gonorrhœa that have been in progress in the navy during the past twelve-month.

## A HOSPITAL IN CHINA

AT a meeting at Friends House on Jan. 31 Miss Freda Utley and Mrs. Charlotte Haldane made an appeal for the International Peace Hospital started in some disused mission buildings in South Shansi. Miss Utley, who had twice visited the front with Chinese doctors, spoke of the misery and stoicism of the wounded in what she described as "a war of flesh against metal." More than half of the Chinese soldiers are suffering from malaria, and there is a shortage of quinine. The wounded are brought on stretchers to hovels or bamboo shelters near a road where they may lie for weeks awaiting transport to a hospital. There are no ambulances and there is a shortage of trucks, and a shortage of petrol to drive the trucks. All those who can get along at all set out to walk for several days along roads which are being constantly bombed, towards a hospital where there is once more a shortage of everything, bandages, drugs, anæsthetics, antiseptics, bedding, instruments and trained care. Mrs. Haldane emphasised that the

new hospital was being scientifically and economically planned. To meet a Chinese need it would be designed on Chinese lines. Casualties would be dealt with swiftly and effectively and there would also be a training-school where volunteers would have courses in first-aid before being sent to the front. Money goes a long way in China, and sixpence will keep a wounded soldier or civilian for more than a day, while ten shillings will pay for a patient at the hospital for a month. A Chinese speaker at the meeting said it sometimes seemed as though we thought China owed us an apology for being so far away and so large; help for this hospital would be a good way of bringing China nearer to us. Gifts may be sent to the China Campaign Committee, Parliament Mansions, Orchard Street, London. S.W.1.

### MICROFILMS AS AN AID TO RESEARCH

IN *Science* for Jan. 13 (p. 32) Mr. Atherton Seidell draws attention to the labour-saving possibilities of microfilms in scientific research. These are photographs on 35 mm. cinema film of the pages of bound or unbound volumes, and about eight inches of such film will carry a copy of a scientific paper ten pages in length. The use of microfilms will, it is suggested, relieve the research-worker of the task of making laborious transcriptions of original literature or the inconvenience of dealing with large tomes or inadequate notes. They will, in fact, relieve him of the necessity of visiting a library at all. Films are already available at four Washington libraries, and they are being produced by a non-profit organisation, "Bibliofilm Service," partly financed by the Rockefeller and Carnegie Foundations. The price is one cent per page plus twenty cents service charge for each article copied. The films can be read by means of a small hand magnifier costing a few shillings or with a larger desk projector.

### NEW PREPARATIONS

STILBŒSTROL BOOTS.—Stilbœstrol is the short name now given to diethylstilbœstrol, a synthetic substance with œstrogenic properties described by Dodds, Golberg, Lawson and Robinson last year (see leading article, *Lancet*, Jan. 14, 1939, p. 97). It is supplied by the Boots Pure Drug Company Ltd., Station Street, Nottingham, in ampoules of 1·1 c.cm., containing 1 mg. and 5 mg. per c.cm., for intramuscular injection, and in tablets containing 0·1 mg., 1 mg. and 5 mg., to be taken orally.

STILBŒSTROL B.D.H.—In presenting their preparation of stilbœstrol the British Drug Houses Ltd. (London, N.1) say that the new drug possesses the considerable advantage of being more active by mouth than the natural œstrogenic hormone. "In general it has been found in the human subject that 1 mg. of stilbœstrol by mouth is equivalent to 5000 international benzoate units of œstradiol benzoate by injection." It is issued by B.D.H. in tablets of 0·5 mg., 1 mg. and 5 mg. and in 1 c.cm. ampoules containing 1 mg. and 5 mg. per c.cm.

NEO-ŒSTRANOL 1 CROOKES is the preparation of stilbœstrol made by the Crookes Laboratories (British Colloids Ltd.) of Park Royal, N.W.10. They state that stilbœstrol, weight for weight, is approximately three times as active as natural œstrone when given by injection; when given by mouth it has about twenty times the activity. The tablets of Neo-œstranol 1 contains 1 mg. and 5 mg. and the ampoules 0·5 mg. in 0·5 c.cm., 1 mg. in 1 c.cm. and 5 mg. in 1 c.cm.

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FROM ROBERTS AND CO., pharmaciens, of 76, New Bond Street, W.1, comes the sixth edition of their Prescriber's List which gives a concise alphabetised account of a very large number of preparations sold under proprietary names, including particulars of composition, form, price, dose and indications. The list has been enlarged, and much of the information it gives is not readily accessible elsewhere. Copies will be forwarded to members of the medical profession on application.

## Appointments

BALL, STANLEY, M.R.C.S., D.P.H., assistant school medical officer for Birkenhead.

BATEMAN, D. S., B.M. Oxfd, M.R.C.P., D.C.H., assistant physician in the children's department, St. Mary's Hospitals for Women and Children, Manchester.

BENNETT, MURIEL L., M.B. Manc., assistant medical officer at the outpatient department of the Royal Manchester Children's Hospital.

CARGILL, W. P., M.B. Manc., D.P.H., assistant county medical officer of health for Gloucester.

DAVIES, HUGH, M.A. Oxfd, M.R.C.S., D.M.R.E., hon. radiologist to the St. John Clinic, London.

DOODY, P. J., M.B., N.U.I., D.P.H., deputy medical officer of health for Wimbledon.

DUNCAN, A. G., M.D. Lond., D.P.M., medical superintendent at the Severalls Mental Hospital.

FLEMING, J. A. C., M.B. Edin., F.R.C.S.E., D.R., radiologist to the Royal Infirmary, Dundee.

GOLDMAN, VICTOR, L.R.C.P., D.A., hon. anæsthetist to the Battersea General Hospital.

HEATH, NEWTON, M.A. Oxfd, F.R.C.S.E., registrar to the fracture and orthopædic department at the Royal Hospital, Wolverhampton.

INNES, L. W., M.B. Edin., F.R.C.S.E., hon. assistant surgeon to the Prince of Wales's Hospital, Plymouth.

KEELE, K. D., M.D. Lond., M.R.C.P., hon. assistant physician to the King George Hospital, Ilford.

LANDER, F. P. LEE, M.D. Lond., M.R.C.P., assistant physician to the Hospital for Consumption, Brompton.

MARSDEN, AUDREY, M.B. Birm., hon. anæsthetist to the Battersea General Hospital.

MARTIN, R. M., M.B. Belf., assistant medical officer at Wadsley Mental Hospital.

ROSS, A. G., M.B. Belf., F.R.C.S.I., hon. assistant surgeon to the Royal West Sussex Hospital, Chichester.

SCADDING, J. G., M.D. Lond., M.R.C.P., assistant physician to the Hospital for Consumption, Brompton.

SHIRLAW, G. B., L.R.C.P.E., temporary assistant medical officer for Battersea.

WHARTON, JOYCE H. W., M.B. Sydney, M.R.C.O.G., hon. assistant gynæcologist to the St. John Clinic, London.

*University College Hospital.*—The following appointments in the department of radiotherapy are announced:—

HILTON, E. L. GWENDOLEN, M.B. Lond., D.M.R.E., hon. radiotherapist;
FRENCH, JOHN, M.R.C.S., first assistant; and
HAIR, J. A. G., M.R.C.S., second assistant.

Examining Surgeons under the Factories Act, 1937: Dr. P. M. OXLEY (Winchester District, Hants); Dr. O. E. WILLIAMS (Longton District, Lancaster); Dr. T. W. BUCHAN (Balfron District, Stirling).

## Births, Marriages, and Deaths

### BIRTHS

ALEXANDER.—On Jan. 31, at Limpsfield, the wife of Dr. Paul Alexander—a daughter.

COOPER.—On Jan. 2, in Buenos Aires, the wife of Dr. Leslie Cooper—a son.

DEAN.—On Jan. 25, at King's Lynn, the wife of Dr. David M. Dean—a daughter.

LEVIS.—On Jan. 27, at Hong-Kong, the wife of Capt. Derek Levis, R.A.M.C.—a daughter.

MACKENZIE.—On Jan. 23, at Geneva, Switzerland, the wife of Dr. Melville D. Mackenzie—a son.

MACLAGAN.—On Jan. 29, at St. Mary's Hospital, to the wife of Dr. N. F. Maclagan—a son.

NICHOLSON.—On Jan. 29, the wife of Dr. B. Clive Nicholson, of Pinner—a daughter.

SAMUEL.—On Jan. 30, at Alexander Park Road, N.10, the wife of Dr. A. R. Samuel—twin sons.

### MARRIAGES

BURNETT—PEARSALL.—On Jan. 26, in London, F. Marsden Burnett, M.D., to Mrs. Marjorie Pearsall.

HALL-SMITH—WINTERBOURNE.—On Jan. 28, in London, Percy Hall-Smith, M.D., to Eveline Daisy Winterbourne.

NORMAN—PHILLIPS.—On Jan. 30, at Brentwood, George Norman, M.B., to Phyllis Annie Phillips.

SANDES—TREGONING.—On Jan. 25, Lieut.-Col. John Drummond Sandes, I.M.S. (retd.), to Rosamunde Tregoning.

### DEATHS

BROCKWELL.—On Jan. 27, John Brocas Chambers Brockwell, M.R.C.S., of Walton-on-Naze.

GRIFFITHS.—On Jan. 29, at Polmont, Stirlingshire, Alfred Griffiths, M.B. Edin., F.R.C.S.E., late Major, R.A.M.C.

JACKSON.—On Jan. 26, at Carnforth, Edward Siddall Jackson, M.B.E., M.D. Edin., aged 82.

MARTLAND.—On Jan. 27, at Oldham, Edward William Martland, M.R.C.S., J.P., aged 84.

PAYNE.—On Jan. 31, at Portland Place, W.1, Joseph Lewin Payne, O.B.E., M.R.C.S., L.D.S.

PHILIP.—At 9, Palmerston Road, Edinburgh, on Wednesday, Jan. 25, 1939, Sir Robert Philip, M.D., LL.D., son of the late Rev. George Philip, D.D., and beloved husband of Edith McGaw.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*